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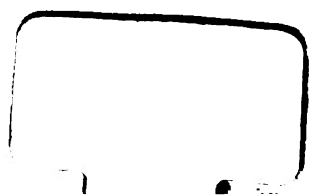
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WAR DEPARTMENT . . . OFFICE OF THE CHIEF OF STAFF.

SECOND (MILITARY INFORMATION) DIVISION.

GENERAL STAFF.

No. 8.



REPORTS

OF

MILITARY OBSERVERS

ATTACHED TO

THE ARMIES IN MANCHURIA

DURING THE

RUSSO-JAPANESE WAR.

(JANUARY 1, 1907.)

PART IV.

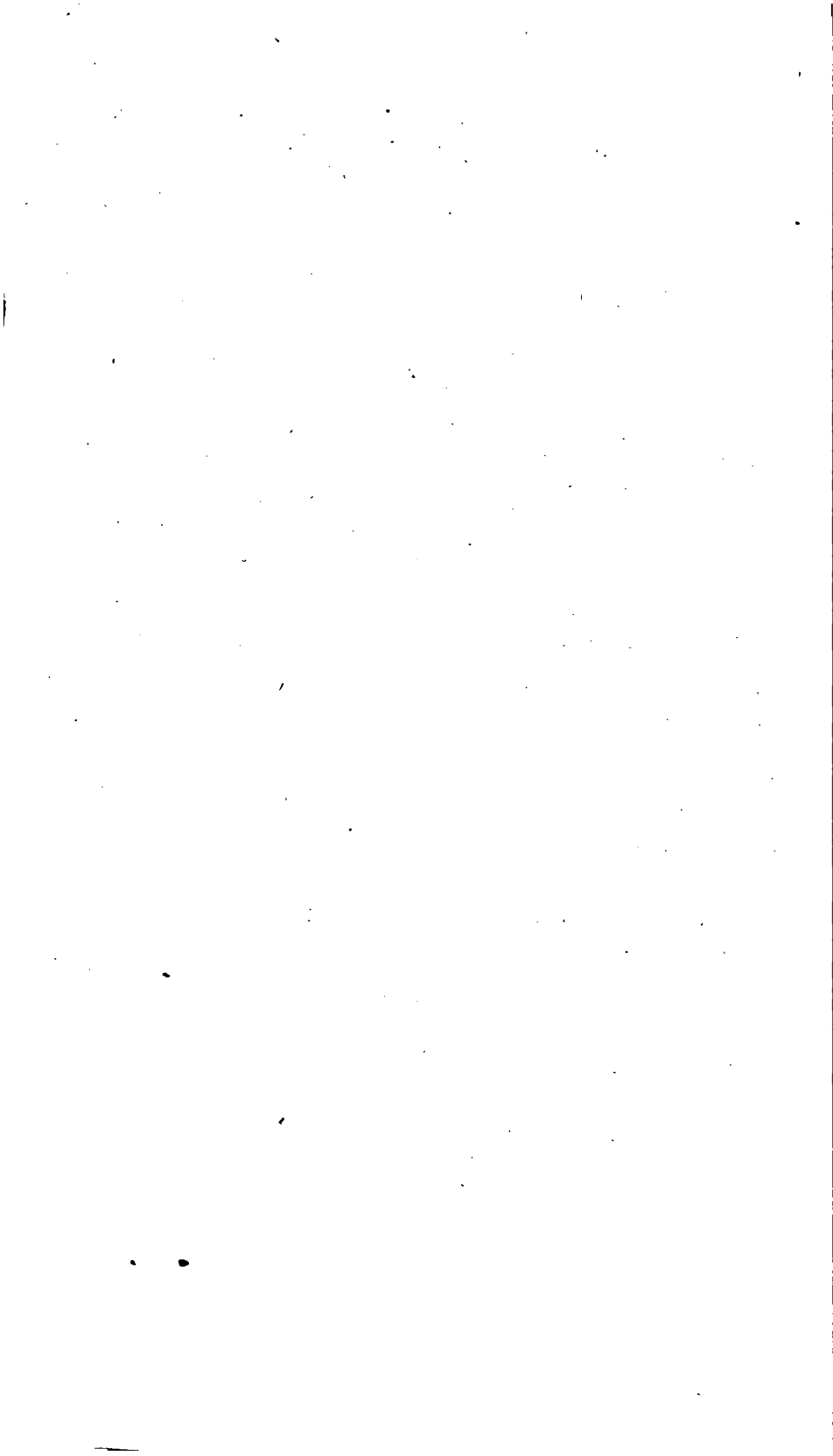
Report of

Major CHARLES LYNCH, Medical Department, General Staff,

WASHINGTON:

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NOTE.

It has not been practicable to publish the complete report of Major Lynch on account of its length. A few omissions have been made in the body of the report and numerous ones in the appendices.

Lack of space also has prevented the printing, in all instances, of the author's acknowledgments of favors received from Japanese and other officers and officials.

The strategical map of part of Korea and Manchuria, and the map of Manchuria in seven sheets, published with Part I of these reports, should be used in connection with this report.

REPORT OF MAJ. CHARLES LYNCH, -MEDICAL DEPARTMENT, GENERAL STAFF, U. S. ARMY, OBSERVER WITH THE JAPA- NESE FORCES IN MANCHURIA.

Major Lynch left Washington November 9, 1904, and arrived in Tokyo, Japan, December 9. He left Tokyo January 16, 1905, and was engaged in inspecting medical department organization in Japan until February 2, 1905, when he sailed from Ujina, the port of Hiroshima, on the hospital ship *Kohilla Maru*, and arrived at Dalny February 7. He went thence to Port Arthur, where he arrived February 10 and remained until February 14, reaching the Second Army, to which he had previously been assigned, three days later. He joined the Eighth Division of that army at Sumapu February 28, and remained with that division until March 9, being present at the battle of Mukden. He rejoined the headquarters of the Second Army March 9, and with it entered Mukden March 11, where he remained until May 10, when he went to Tiehling. On May 11 he again joined Second Army Headquarters at Chingungpu, and moved with it on June 10 to Tangshanchintai. He left the latter place September 7 to inspect the lines of communication, and sailed from Dalny September 12 on the Japanese transport *Bingo Maru*. He reached Ujina September 15, arrived at Tokyo September 21, and remained there, engaged in further inspection of the medical department, until October 28, when he embarked for San Francisco, and returned to Washington November 18, 1905.

GENERAL ORGANIZATION OF JAPANESE ARMY AND FIELD OF OPERATIONS.

As it is hardly within the limits of my inquiry, it is not my intention to treat exhaustively the general organization of the Japanese army; but in order that the work of the medical department of that army in the Russo-Japanese war may be clearly understood it is deemed desirable, as a preliminary

to discussion of that department, that a few pages be devoted to general organization and to the field of operations, therefore this report begins with the recital of some pertinent facts in reference to these.

Officers: Some of the older line officers of the Japanese army have had no schooling except experience, which, with the majority, has been extensive under war conditions. At present, however, great attention is paid to the military education of officers. Six local military schools, a central military school, and a military cadet school, both of the latter in Tokyo, are in operation. About one-third of the candidates for line commissions pass through all these schools, and two-thirds come to the Military Cadet School from sources other than the Central Military School. The former class spends six months in the ranks before entering the Military Cadet School and the latter one year; during this period all serve as privates. After completion of the Military Cadet School course, six months' more service is required in the grade of noncommissioned officer, after which a final examination is held and successful candidates are commissioned. The course in the Military Cadet School is wholly military in nature, and officers only are employed as instructors, but in the other schools civilians teach all the nonmilitary branches.

A few noncommissioned officers also become line officers. Such commissions are usually conferred for exceptional gallantry in action or to fill vacancies at the front which can not be otherwise provided for. It is the policy of the Japanese Government, however, to try out noncommissioned officers who are selected for possible commissions, and they are therefore commonly required to serve a probationary period of a few months in the grade of the highest ranking noncommissioned officer before being appointed as officers.

The age for entrance to the Local School is from 13 to 15 years. Three years are spent there, two in the Central School, and one in the Military Cadet School. This makes the age for entry into the service of candidates who complete the entire course from 20 to 22 years (Japanese). Those who attend the Military Cadet School only are slightly older when they become officers, and those from the ranks considerably so.

In reference to the results secured by the methods just described no further statement is required here than that Japanese line officers entering the service are well qualified physically for the duties which they will be called upon to perform, and that they are well instructed in sanitation, being fully alive to its importance in relation to the effectiveness of an army.

In addition to these preparatory schools, special-service schools, in which the course is about one year, are conducted for each of the different branches of the line of the army. The intendance and medical departments both have schools corresponding to these. The War Department has also a Staff College for the higher education of line officers, and a number of such officers are sent abroad yearly for special study. The majority go to Germany, but artillerymen are still very commonly instructed in France.

As is well known, the Japanese maintain a reserve, as well as an active, army. The former has officers belonging to both the first and second reserve. Some of these have passed from active into reserve service, receiving much or little instruction in the former, according to their date; others have had the experience of former wars; others, still, have never previously served as officers, but have been conscripts. These may come from those who have so served for their full three years or from the one-year class, and the latter may have served their year at the regular time or may have postponed it to a maximum age of 28 years. Noncommissioned officers may also be directly made officers of the reserve. Yet another class may be found, though such officers are met with in the medical and intendance departments more often than in the line. These have had no previous service or military instruction of any kind, being directly appointed as reserve officers after serving a few months' probation. All officers on the reserve list are kept abreast of their profession as far as may be by the instruction imparted at the rather frequent maneuvers for which they are called out. Physically, reserve officers were naturally not so good as a class as those of the active list, but they were by no means badly fitted to perform the duties required of them.

It should be noted that the Japanese system for the education and employment of officers leads to specialization and not to generalization. The special schools foster this, and officers who have gained the benefits of a course in the Staff College are used for important staff positions and ultimately for higher commands. They do not go back to routine duties with troops. Full advantage is also taken of the special qualifications of reserve officers in their employment. Some of these men, especially the older officers, have had no special business or professional experience which would fit them for the positions to be mentioned later, so that they can only be employed where their habit of the command of men will make them of value, for instance, as commanders of line of communication posts, or of storehouses, and in other like positions. Others of this class, and the great majority of the reserve officers who have only had conscript service, have, after leaving the active army, gone into business or practiced a profession, and are valuable on account of this experience in civil life. So bankers are given reserve commissions in the intendant department, those acquainted with foreign languages reserve line commissions as interpreters and translators, and railway and steamship men the same class of commissions in the transportation and communications department. Reserve officers called out for maneuvers are, so far as possible, employed in duties similar to those for which they will be detailed in time of war.

As surgeons are promoted under the same regulations as other officers, this subject will be treated under the head of medical officers.

The Japanese intend to use active officers principally at the front and for the more important positions on the lines of communication and in Japan. The magnitude of the recent war required, however, that many from the reserve should serve at the front, and some few exceptionally well qualified officers of this class held very important positions with the active army as well as at home.

Soldiers.—The ranks of the Japanese army are filled by conscription (the few volunteers may properly be disregarded here) and it is probable that during the war, with

few exceptions, all men reaching the conscription age, 20 years, who were physically able to pass the prescribed examination were taken as soldiers. Before the war this was by no means the case, however, as the number of men available yearly was largely in excess of the needs of the standing army, and at that time many were exempted from serving. After these had been excused a drawing was held to determine which of those left should be examined physically. The men selected were then sent to the medical examiner of their conscription district, who proceeded to divide them into five classes according to their physical characteristics. *A* class, now as well as then, comprises those who are in every respect physically fitted for line soldiers; *B*, those not good enough for the line but qualified for the train; *C* comprehends men who are physically poor, but who may still be used; *D* includes men who are not organically unfit, but who at the time of examination have temporary affections which renders them unacceptable; *E* comprises men not physically qualified for soldiers and requires no further consideration. *A* and *B* classes are at once available for the standing army, *A* for the line and *B* for the train, but when vacancies do not exist for all men of one or both of these classes—and this was the rule before the war—excess men go into the hoju; *C* class men go into the second “*koku-minke*” or second national army; *D* class are called and examined again at the end of the year, and if then found physically qualified are taken into their proper class; if not qualified they may be called at yearly intervals, so long as they are within the limits of age, but in practice a man found physically unfit a second or third time is no longer looked upon as a possible soldier.

16 MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR.

The following scheme shows the plan before the war and at the end of it:

[1902—Called 428,000; drawn 191,000.]

45,000.	146,000, less physically unfit.
<p><i>Active army.</i></p> <p>Ages: 21, 22, 23.</p> <p>(Students 1 year service only; all others 3 years.)</p> <p><i>Yobi (first reserve).</i></p> <p>Ages: 24, 25, 26, 27.</p> <p>Three weeks each year, division commander determines when and for how long they will be called. Usually 6 weeks every 2 years.</p> <p><i>Kobi (second reserve).</i></p> <p>Ages: 28, 29, 30, 31, 32.</p> <p>Three weeks each year, division commander determines when and for how long they will be called; 6 weeks in 2 years usual period.</p>	<p><i>Hofu.</i></p> <p>Available for call for 90 days a year for 7 years; time of year is not fixed, but is determined by Minister of War. It is stated that on account of lack of money this regulation was almost a dead letter, and practically no training was given these men.</p>
PRESENT LAW.	
<p><i>Active army.</i></p> <p>Ages: 21, 22, 23.</p> <p>(Students 1 year service only; all others 3 years.)</p> <p><i>Yobi.</i></p> <p>Ages: 24, 25, 26, 27.</p> <p><i>Kobi.</i></p> <p>Ages: 28, 29, 30, 31, 32, 33, 34, 35, 36.</p> <p><i>First national army.</i></p> <p>Ages: 37, 38, 39.</p>	<p><i>Hofu.</i></p> <p>To 40 years of age.</p>

It should be noted that the Japanese count a person as 2 years old on the first anniversary of the day of birth, so that these figures are each one year too high, according to our method of estimating age.

The most important change in conscription shown in the above table is that by increasing the period of the reserve four years, from 33 to 37, about 160,000 additional men were made available for service. All men up to the age of 40 years are available under the new law, but this was a polit-

ical move rather than one to increase the effective strength of the army, as Japan desired to publish to the world that her forces consisted of 800,000 men, with military service, and of 2,400,000 men, without such service.

It has already been mentioned that *C* class men form the second national army, which would expect to be called if the first national army was exhausted. The remainder of the physically available men of military age, without military training, constitutes the territorial army. So far as known, neither of these classes has been called upon during the recent war.

In the early part of the war the Yobi was called under the colors, going in to fill vacancies in the active army. It is possible that some of the younger men from the Kobi were used for this same purpose, but other soldiers belonging to it were called for special Kobi organizations, where the great majority of them were found. Just how deeply the reserves and the hoju were cut into, the Japanese will naturally not disclose, nor, for the purpose of this report, is it necessary to state more than two facts: Men between the ages of 20 and 36 could be found in the ranks by the end of the war, and the physical standard of the army was well maintained; the few volunteers less than 20 may again be disregarded.

From what has already been said, it has been seen that soldiers are divided into two main classes, the line and the train or service corps. Line soldiers may become hospital soldiers or may go into the intendance department, and the medical department has certain other soldiers, as will be seen later, but the true line of demarcation is between the line and the train soldier. The former has his own work to perform, all of which is in connection with actual combatant duties, and the latter furnishes supplies, etc., for the former. Line soldiers are not diverted to other duties; their business is to fight, and every energy is devoted to teach them to do so. The train soldier, on the other hand, has his own special duties, and he is made proficient in these and in these only.

Civilian employees.—The Japanese had a great deal of difficulty with Japanese civilian employees in the Chinese-

Japanese war, as such men were not amenable to discipline and, from their careless habits, were extremely prone to disease. At the beginning and throughout this war many civilians, with "Hannin" rank (assimilated rank) have been employed as interpreters, etc., but at the beginning of the war it was considered advisable to use as few of the mechanic and coolie classes as possible outside of Japan, though from necessity in some of the armies numbers were always employed. As the demands of the front increased it became necessary to employ more and more Japanese civilians on the lines of communication, and the railway and telegraph services fell largely into their hands. Chinese were also hired in large numbers, especially for teamsters and coolies. It must be remembered, however, that, under the Japanese system, dependence at the front is not placed on the civilian teamster, but that such positions are filled by train soldiers.

It may be well here to call attention to the fact that in the Japanese service money furnished for the army is for the purpose of the war and is not divided into a number of different appropriations, with consequent difficulty in accounting for expenditures. Great liberality is manifested in hiring civilian labor, etc., when necessary, nor is special authority required for making expenditures, which are of routine character. In order that the various departments may not raise prices by bidding against each other for labor, etc., the military administrator of a district fixes prices to be paid and no one is allowed to exceed these. At times, such as in battle, when prices can not be fixed, needed labor is hired without limit as to amount or price, these being left to the judgment of the commanding officer of the organization concerned.

Patriotism and Discipline.—Consideration of the Japanese army would be very incomplete without some reference to the high order of patriotism manifested in it. This was seen in all ranks of the army and in the Japanese civilian employees, as well as in the officers and soldiers. Military discipline in Japan is rather peculiar to western notions. While disobedience of orders is almost unheard of, the relations of officer and soldier are close, in fact are rather those of parent to child than those of our military ideal. This same

spirit pervades the Japanese nation in regard to their Emperor, who is looked upon as the head of the family, as well as the ruler. The calling of a soldier is held in high esteem, and after men are once made acquainted with their duties, it is impressed upon them that proper performance is only what is expected of every true soldier of Japan. There is little nagging or interference with men in small details, the system aiming rather to set certain tasks for them and to allow them to accomplish these, as far as may be, in their own way.

Organization.—Japan has a Minister of War, who is charged with the duty of controlling the military administration and of superintending the various military organizations, including the officers, soldiers, civilian officials, and employees. In the War Department five bureaus are established: (1) Bureau of Personnel; (2) Bureau of Military Affairs; (3) Bureau of Administration; (4) Bureau of Medical Affairs; (5) Bureau of Legal Affairs. The chief of each of these bureaus has direct access to the Minister of War.

The three staff departments of importance for the purposes of this inquiry are the medical, the intendance, and the department for transportation and communication. The first will be discussed at length later; the second has three subdivisions—pay, construction, and supplies. The allowance of intendance (pay) officers is much more liberal than with us, they being detailed to regiments, field medical organizations, hospitals, etc. This department assumes the duties of construction performed by our quartermaster's department. The supplies furnished by it consist of food and clothing. The department for transportation and communications, which, in peace, operates under the War Department, having a director there, is transferred to Imperial Headquarters in war. It is not, however, a staff department in the sense of the two first mentioned, as officers do not hold permanent positions in it but are detailed from the line as port, transportation commanders, etc.

A Commander of Military Education is also detailed for control of that branch of army administration.

In addition to the War Ministry, the Japanese have a *General Staff*, the chief of which is charged in general terms with the duty of conducting all matters in reference to mobiliza-

tion and strategy. General Staff Headquarters is apparently merged into Imperial Headquarters on the outbreak of war, the Chief of the General Staff acting as Inspector-General of the lines of communication with any garrison (general lines of communication) established abroad under him, as are also the inspectors of the lines of communication of the separate armies, so far as certain of their duties are concerned.

The unit of organization in Japan is the division. The entire empire is divided into thirteen division districts, the headquarters of each of which is at a different place, except that two are located at Tokyo—the First and the Guards. The commanders of these divisions are lieutenant-generals, appointed by the Emperor. These commanders, although they receive directions from the War Department, the Chief of Staff, and the Commander of Military Education, have large powers within their own commands, controlling all the military organizations there and the conscription. They report directly to the Emperor in person, as well as making written reports to the above-mentioned departments.

The headquarters of each division has the following departments: (1) Staff Department; (2) Aid-de-Camp Department; (3) Judge-Advocate Department; (4) Administration Department; (5) Medical Department; (6) Veterinary Surgeon's Department.

The division is complete in itself, with its reserves, stores, transportation, etc., and may at once be mobilized in the event of war—perfect, so far as the Japanese table of organization is concerned. Each battalion has its own light transport (pack ponies), which follows immediately in rear of its unit. The heavy transport of the entire division (carts) is united to march in its rear. Thus there is no long train to hamper the fighting troops. In the light transport nothing is carried except what is needed during action. This comprises ammunition, engineer tools, etc., and battalion medical supplies for the temporary dressing station. The 40 pack ponies, carrying the supplies of the sanitary company, are placed immediately in rear of the division to which they belong. The heavy baggage train of a division is required to remain 4,000 meters in rear and camps independently. It consists of 1,600 carts and is divided into two

sections, one of which keeps 4,000 meters in rear and the other from 6,000 to 8,000 meters. The composition of the sections varies; when an action is expected, the ammunition and the field hospitals move up, and the food falls back. At least two field hospitals are found in the first section. In battle pack ponies from a battalion come back to the train for more ammunition, etc., and food, cooking utensils, etc., are hurried to the front as soon as darkness comes, the carts then being returned to the train to be loaded for the next night. There are also changes between the empty carts and the full ones in the two sections, and the former are sent to the rear for fresh supplies. These may be secured from a depot or from hired Chinese carts, which may constitute a train in the rear, separate from the regulation division train.

The divisions maintain their home organization in war as well as in peace, the mobilized units being sent to the front, but a division immediately replacing the one leaving. This new division is called literally "the division replacing that which has gone to the front." It has the usual division organization, and not only conducts its own affairs, but also serves as reserve to the division which it has replaced and is intrusted with all home matters pertaining to it. Thus, at the home division, soldiers of the division district are collected and trained for ultimate forwarding to the front to fill vacancies in the division there. Soldiers coming home report at division headquarters and are returned through the home division. Sick are sheltered and cared for in division hospitals. Soldiers' records and accounts are kept at the home division, and most supplies are divisional, being sent out from and returned to its headquarters. This organization is an excellent one, not only making administration easy and effective, but there is great esprit de division found throughout the army.

As the war went on the 13 original divisions and the other troops mobilized—to be spoken of immediately—did not prove sufficient in numbers for the work in hand and other divisions were organized. It is the general opinion that there were 15 divisions in the field at the battle of Mukden, and probably as many as 18 at the time Sakhalin was taken, and the Japanese forces were increased in northern Korea, in the

vicinity of the Tuman River. These extra divisions are believed to have been raised by the different division districts contributing battalions, squadrons, batteries, etc.

In addition to the 13 divisions, at the outbreak of war, there were 2 independent brigades of cavalry, 2 independent brigades of artillery, 19 battalions of fortress artillery, of which 15 were joined in a regiment, 1 railway engineer battalion, and 1 battalion of telegraphers. The 2 independent brigades of cavalry had each 2 regiments of 3 squadrons, and the 2 independent artillery brigades had each 3 regiments. In addition, from the second reserve or Kobi, the Japanese hoped to make 76 battalions of infantry, 17 squadrons of cavalry, 19 battalions of artillery, 13 engineer companies, and 13 train companies—that is, they desired to put in for each division, from these Kobi troops, 4 to 6 battalions of infantry, 1 squadron of cavalry, 1 battalion of artillery, and 1 train company, or practically a brigade to each division. The total of Kobi troops was about 80,000.

Coincident with the outbreak of the war, the various divisions and separate brigades were aggregated into armies. Five such armies, or, as they might perhaps be more properly called, corps, were present in Manchuria at the time of the battle of Mukden. This does not include the Japanese forces in northern Korea, the number of which was carefully concealed. The ordinary allowance of divisions to each Manchurian army was three, but this was not absolute, neither were the divisions composing an army always the same. For example, at the time of the battle of Mukden, the Second Army had four divisions, while at least one other army had but two. The divisions of the Second Army at that time were the Third, Fourth, Fifth and Eighth. The Sixth division, which had formerly been with it, had been assigned to another army. Later, further changes took place, the Guards Division coming to the Second Army sometime in June from the First Army, with which it had been since the beginning of the war, and other divisions being shifted from army to army. The Kobi troops were organized as separate brigades under the army commanders. A certain amount of artillery also belonged to the army. In the battle of Mukden the Second Army is said to have had one regiment. Each army

had its own lines of communication, with its own commander. All the armies in Manchuria were under the command of Manchurian army headquarters. Any estimate of the number of soldiers Japan had with the colors by the end of the war can be little more than the veriest guesswork. From 700,000 to 800,000 seem to be the figures generally fixed upon.

The methods for obtaining supplies for this great body of men were excellent. Medical department supplies will not be referred to now, as they must be spoken of with more detail. The Japanese have a great arsenal in Tokyo, which employed 30,000 persons at times during the war. This has a few branches located in other cities. The arsenal manufactures guns, rifles, ammunition, carts, saddles, ordnance equipment, etc., in fact everything required by the army except food and clothing. Manufactured articles go to division depots generally, but a few, such as the soldier's water bottle and his ration can, are delivered to the intendants department for issue. The latter department has great depots in Tokyo, with branches located at other places. In its food depot, in the former city, food is prepared for field use and is also purchased. The intendants department also operates shops in Tokyo in which cloth is made and where clothing, including shoes, is manufactured and bought. Articles other than food are commonly distributed to the troops through divisions. Naturally, from both the arsenal and the intendants depots, articles were sometimes sent directly to Manchuria. Transport was commonly assembled at the division headquarters, but many animals for the various purposes of the army were finally purchased in China.

In the recent war the War Department may be said, generally speaking, to have controlled military affairs in Japan, while Imperial Headquarters regulated those abroad. At home the railways, whether government or private, were placed entirely at the disposal of the department of communications and transportation for any use they might require of them. Their control was vested somewhat in station commanders, though these officials depended on the railway officials for the operation of the trains. The two great ports for the embarkation of troops, supplies, etc., from Japan, and for the return of sick, prisoners, troops, etc., were Ujina and

Moji, each of which had its own port commander, who acted as station commander as well. The port commanders held very much the same relation to the ships' captains of the various subsidized liners used by the army as do the companies' agents in time of peace. Shimonoseki Straits, on which Moji is located, is such a poor harbor, on account of its swift current, that Ujina was used more and more as the war went on. The statement was made there that 90 subsidized transports were in commission in September, 1905. Supplies for the front were turned over to the department of communications and transportation, which usually sent them by rail to one or another of these ports, where they were sheltered in large storehouses. Ujina had been previously used as the port of embarkation for a Japanese army abroad, and a good deal of work had been done to fit it for this purpose. Besides the storehouses, water is laid on to the dock, and shops are maintained in time of peace with a number of skilled workmen. The fittings of the subsidized ships are stored in these shops, and workmen from them change a ship so that either men, animals, or stores may be transported. This is done with great expedition, and stores are carefully separated so that no confusion arises in unloading ships on arrival at their destination.

Abroad, in Manchuria, Liaotung garrison—really the general lines of communication of all the armies there—had its own commander, who was under Imperial Headquarters, Marshal Yamagata, Inspector-General of the lines of communication. As stated, the inspectors (commanders) of the lines of communication of the separate armies also received certain orders from Imperial Headquarters. The idea, both in the establishment of Liaotung garrison and putting certain of the duties of the inspectors of the lines of communication of the separate armies under Imperial Headquarters, was, of course, to free the commander of the forces at the front so that he might devote all his attention to the latter. At the various stations on the lines of communication, both in Liaotung garrison and of the lines of communication of the separate armies, station commanders, under their proper commander, also executed their special duties. The operation of the railway in Manchuria was, naturally, wholly in the hands

of the army. Early in the war, when Liaotung garrison was first established, its area was limited, but with the advance of the armies north it was gradually extended. Immediately preceding the battle of Mukden its northern line was just south of Liaoyang. By July 1 it had included Mukden, and by September 1, Tiehling.

As soon as the Japanese had captured Dalny and Yingkow those ports were made their Manchurian bases, to which soldiers and supplies came from Japan and from which they were sent to the front. The Japanese say the Russians were very kind to them in building the excellent docks at Dalny, without which it would have been extremely difficult for them to have carried on the war, and this point after its capture was always their principal port, under its new name—Tairen. Stores for the army in Manchuria were nearly always consigned to the main Manchurian storehouse at Tairen, from which they went to its branches in other towns and finally to the individual armies. The Manchurian Railway led north from Dalny, with a branch to Port Arthur and another to Yingkow. The main line passed through Tashihchiao, near Haicheng, Liaoyang, Mukden, through Tiehling, and near Kaiyuan, on its way to Siberia. As it fell into the hands of the Japanese, they were compelled to change its broad gauge to their narrow one.

The country near Dalny is much broken, while farther north wide flat plains are found, of wonderful richness for agricultural purposes, on which the Chinese inhabitants raise large crops of kaoliang (sorghum), beans, poppies for opium, tobacco, etc. Farther north, 20 or 30 miles beyond Tiehling, mountains, or rather broken foothills, are again encountered, which are not nearly so rich. There are some large towns in Manchuria, notably Liaoyang and Mukden, but the majority of the population is gathered in small villages, from which the inhabitants go out to till the fields in the vicinity. The ground over which most of the battles of the Second Army were fought is very flat, though it is somewhat broken here and there by sand dunes and Chinese graves, and by streams, which had cut deeply into the alluvial soil, so that their banks afford good shelter from fire, for which purpose they were extensively used, as were also the mud walls of Chinese villages.

The climate of Manchuria is hot for a short time in summer, when it is also wet. In winter the temperature falls to about 15° F. below zero in the south, but as the humidity is low then this is not severely felt, except when there is a wind, which is not a common occurrence near Mukden at this season, though in the vicinity of Dalny there are frequent bitter gales. In the wet summer the roads are almost impassable for wheeled vehicles at times, as the Chinese have never constructed good highways, nor do they need them, as they work in the fields during the summer and haul their produce to market in the winter, when nature makes good roads over the entire country. There are thousands of Chinese carts in Manchuria. These proved of the greatest value to the Japanese, who employed them liberally to supply their long line, which, it will be remembered, at the end of the war extended some 40 miles north of Tiehling, from the Mongolian border on the west about 100 miles to the east. Even with all the Chinese carts, during the summer of 1905, the energies of the Japanese were taxed to the utmost in furnishing their armies with materiel and food.

MEDICAL SERVICE PROPER OF THE JAPANESE ARMY.

PERSONNEL.

Medical officers, active list.—These are of three classes: First, graduates of the imperial universities; second, graduates of other medical colleges; and, third, license holders. Both universities and medical colleges are governmental institutions, whose graduation certificate confers the right to practice medicine in Japan. Others than graduates from these schools are required to pass an examination before the Home Department, which then, in the case of successful candidates, grants certificates, permitting the recipients to practice medicine. There was formerly a much larger number relatively of the last class of physicians in Japan than is the case at present, and, as a matter of fact, in the army they are still most numerous as medical officers, while graduates of the imperial universities are fewest—not more than 10 per cent of the total number. At present the majority of military surgeons entering the army are recent graduates either of the medical schools or of the universities, in both of which the course is four years. At the former appointments are made on recommendation of the faculty in the second year of the course only, but in the latter this recommendation may be made at any time. After such an appointment has been received it carries 10 yen per month in the colleges and 15 yen in the universities, the candidates entering the service immediately on graduation. Graduates may also be appointed immediately after graduation, and then have the same status as though the appointment had been received during the course, but this method seldom seems to be followed in practice. The law provides that practicing physicians may be taken after examination, but none now enter in this way, and the law permitting it will probably be repealed, as the medical authorities of the War Department believe that only failures in civil life are thus secured.

Graduates of the colleges and universities serve a probationary period of four months with a regiment before they receive commissions, and license holders spend one year in the army medical school and then have the same four months' probation. There is an examination at the end of the course at the universities and schools, and license holders have their own examination for preliminary qualification and admission to the army medical school. Both, after the four months' probationary period, come before a board made up of the surgeons of a division, which, in the case of successful candidates, recommends that they be commissioned. As far as possible, admittance to the service is based on the recommendation of competent observers and not on examination. The limits of age for medical officers entering the service are from 20 to 35 years. Graduates of the imperial universities are commissioned originally as first lieutenants and all others as second lieutenants. The four months' probationary period with the regiments, spoken of above, completes the medico-military education of surgeons. After they receive their commissions, no examinations are held for them.

According to Japanese standards the army secures good material for medical officers, but private practice presents superior attractions to a great many of the higher class men, and the army is not quite so popular as the navy, though there is not a great difference in choice between them, in the estimation of candidates for the public medical services.

Medical officers on the active list are promoted exactly as are all other officers. The regulations in regard to this provide both for selection and for promotion by seniority. The minimum time for promotion from the grade of second lieutenant to first lieutenant is two years; this is by seniority only. In advancement from first lieutenant to captain one half are selected and the other half are promoted by seniority; two years is also the minimum period for this. To major and the higher grades, selection is the only method employed. The minimum service in each grade, to entitle an officer to promotion to the next above, is as follows: Captain to major, four years; major to lieutenant-colonel, three years; above this, two years in each rank, except in that of major-general, for which three years' service is required for promo-

tion to lieutenant-general, the highest grade in the medical department. War service counts double for promotion and pension.

It is impossible to determine how far merit is considered in selecting candidates for promotion, but a graduate of an imperial university has a great advantage over all other officers, and, as in other branches of the Japanese army, a member of a samurai family is always shown much more consideration than a man who springs from the common people. It is the policy of the present Chief of the Medical Bureau of the War Department to limit promotion to the grades above major to graduates of the universities. The most important posts in the field are given to such graduates, and they also command the base hospitals at home. Holders of medical diplomas from high-class medical schools abroad are said to be treated, in the matter of assignment and promotion, like university graduates. The method of promotion above outlined of course creates in the medical department a specially favored class, which consists almost wholly of graduates of the imperial universities. These should be the best men, they are certainly best qualified by education on entrance, but the system followed can not but stifle effort among nongraduates of the universities, as they have so little to hope for in the way of promotion and assignment.

The number of military surgeons on the active list at the outbreak of the war is reported to have been 1,076. This was a liberal allowance, which was based on the requirements of war and not merely on the number needed for the care of patients during peace times. The division organizations are maintained in peace as well as in war, and a permanent garrison hospital is operated at each division headquarters, to both of which are large medical staffs detailed. The further surplus is provided for principally with the infantry regiments, which have ten surgeons, with a major as chief in peace, the major going out in war in command of a field hospital, and a captain becoming regimental surgeon.

Reserve medical officers.—With all the large surplus of medical officers of the active army in time of peace, this is not believed adequate for a war, and a reserve is main-

tained, which is stated to have had 2,317 officers at the beginning of the recent contest. Reserve medical officers are of three classes: First, those who have passed into the reserve because they have not attained a certain rank in the active army at a certain age and those still physically qualified, who have passed out of the active army for certain other reasons; second, those who have served their conscription, of which they have six months as ordinary soldiers and six months under the medical department, receiving instruction in reference to medical matters and then an examination. Successful candidates have three months' more service, similar to the probationary period of the medical officers on the active list, then another examination, and, if they pass this, they go into the reserve as medical officers. Such men usually postpone their conscription period until they have completed their medical education. Medical students, who draw numbers compelling them to enter the army as conscripts, may, however, be excused from all but one year of such service on condition that after graduation they become reserve medical officers. Third, those who are taken in as reserve officers directly during a war. These receive from two to four months' instruction. This constitutes their probationary period, one-half of which is spent in a regiment and the other half in a hospital. At the front, in case of need, division commanders are also allowed to appoint noncommissioned officers and privates, who have licenses to practice as physicians, as reserve surgeons on probation. The rank given reserve officers in this war on original appointment was, as a rule, that of second lieutenant, but graduates of the imperial universities were made first lieutenants, and a few experienced men of high attainments were commissioned as captains. Officers of the reserve are promoted by selection from one rank to the next higher one. The same period of service is required of them to permit promotion as of officers on the active list. In peace, when they have completed the required period of service in any grade, they are called out to maneuvers for promotion, and successful candidates, after an examination, are forthwith advanced to the next higher grade. In war, those qualified are promoted after having had the requisite length of service.

In the recent conflict, the active list was slightly augmented in numbers, but the great increase came by the appointment of new reserve officers, and many reserve medical officers were necessarily employed at the front.

Instruction of medical officers.—The army medical school is conducted for the active list only. It has two classes of students: First, medical officers selected for special courses; second, candidates for commissions, who hold the certificate of the Home Department, having passed the required examination, and who take the course to fit them for medical officers of the army. The regular course at the school, that given to the latter class, consists of: (1) A general sketch of the Japanese military system and organization, for which the instructor is a major of cavalry or infantry, or some other officer specially qualified to teach the subject; (2) Regulations of the Medical Service; (3) internal medicine; (4) surgery; (5) hygiene; (6) bacteriology. As stated, this course is one year in length, and the other for surgeons is four months, with an extension of four months when required, and may be along any special line of medico-military interest, such as hygiene or surgery. Surgeons on the active list, on probation with a regiment, study: (1) Field Service regulations; (2) individual drill; (3) mounted squad drill; (4) Regulations of the Medical Service; (5) Infantry Regulations; (6) hospital service (object lessons), and the course for reserve surgeons, newly appointed, is on the same lines, though it is less extensive. Reserve surgeons, in time of peace, are instructed by means of maneuvers, to which they are called out every year or every two years.

The Japanese medical department authorities consider that special training and experience are essential for military surgeons. Reserve surgeons were not used, as a class, for the more important administrative positions; for those which they were called upon to fill, their training at maneuvers is believed to have proved of great value. The Japanese state that the services of the third class of reserve surgeons—those without previous training—have proved very unsatisfactory, not only because of their lack of knowledge of military matters, their unwillingness to conform to the army

medical supply table, and their susceptibility to hardships, but also for the reason that they did not have the confidence of officers and soldiers generally, which resulted in little heed being paid to their advice and recommendations on the subject of sanitation.

No civilians are employed as surgeons with the army during war or peace; that is, no contracts are entered into with civilian physicians according to our method.

The ability manifested by the medical officers of an army may preferably be considered under three heads: First, as part of the body military; second, as sanitarians, and, third, as practitioners of medicine and surgery. The Japanese medical officers proved themselves preeminently able in respect to the first. Until about forty years ago Japan had no organization for the care of sick and wounded, and patients received only the chance treatment of a comrade, the helpless solving all questions as to their care by committing hara-kiri. The present excellent organization of the medical department may therefore be regarded as one of the marvelous advances which Japan has made during this brief time. This organization is not, of course, original with the Japanese, Germany having been the model most nearly followed, as in army organization generally, though France, which was at one time Japan's military teacher, was partially responsible for it. It can not, however, be said that either country was slavishly imitated in the Japanese organization, which, on the contrary, has many features all its own. The Japanese medical department has not only been peculiarly successful in picking out the good and in rejecting the bad in organization, but their administration and their methods for the utilization of all means at hand were also admirable. As sanitarians the Japanese medical officers also did good work. The place which sanitation is given in the studies of the Japanese physician is relatively much more important than with us, so that medical officers entering the army are fairly well informed on this subject. They also have their attention particularly directed to it during peace. The recent war, too, is the third in which Japan has been engaged within the past few years, and her medical officers, always keen to observe and to profit by their observations,

have benefited largely by their experience in the sanitation of armies under war conditions. Bad sanitation in the Chinese-Japanese war was responsible for a long roll of deaths and disabilities, and the lesson, though a bitter one, was well learned. The ability shown in the practice of medicine and surgery by the medical officers of an army is, of course, mainly dependent on the current medical teaching of the country in question. This subject will be discussed more fully when all the physicians and surgeons which constituted the medical talent of the Japanese army have been spoken of, but mention should be made here of the fact that the important administrative duties which the Japanese medical officers were called upon to perform did not apparently lead them to neglect the study and practice of medicine and surgery. In time of peace the large size of the Japanese army affords them opportunities for practice rather superior to those of civilian physicians, and it is believed that they take full advantage of these. The Japanese medical officers displayed great gallantry in the recent struggle, fully sustaining the reputation they had previously acquired, and devoted themselves to the care of their patients with praiseworthy unselfishness.

Personal equipment.—In the field the Japanese medical officer carries nothing under the regulations except a metal case for instruments, which is small enough to put in the pocket. He wears the inevitable side arms of every Japanese officer and not infrequently has a dispatch case.

Allowance of medical officers—their official relation to commanding and other officers.—The profession of medicine is held in high esteem in Japan, and it is generally realized that the increase in the Japanese population, and consequently much of her present power, have been due to modern methods of sanitation and of treatment of disease. In the belief that the army should participate in the benefits which accrue to the population generally from such methods of sanitation and treatment, and realizing that, in order to accomplish anything effective, it is primarily essential to provide medical personnel in sufficient numbers, the authorities have done so. The public generally are imbued with the same feeling, and sentiment induces them to believe that

the most liberal medical personnel will only provide the attendance which the officers and soldiers of Japan merit. There is nothing spasmodic in reference to this in Japan. The responsible authorities know by experience what they will require in medical personnel, and the people are quite willing to leave the matter to them, only holding them responsible that there shall be no fiasco at the beginning of a war nor at any other time. Of course the only reasonable way to create an organization for war is to make the necessary arrangements in time of peace, and this was done, from the knowledge and experience of the authorities, but by the will of the people. Though the medical personnel provided was liberal in comparison with standards established in the past, lack of physicians and surgeons did not permit it to be as large as that contemplated by the Japanese regulations, and the tendency in Japan is to have in future the standard provided by regulations or even a more liberal one.

Officers generally in Japan are informed on the importance of the medical department as a part of the body military and its true functions with an army, and are also instructed in sanitation. Medical officers do not attempt to dictate to commanding officers—far from it—but they do perform those duties laid down for them in regulations: "The medical department is charged with the duty of looking after the health of the army and of caring for the sick and wounded. This will include all matters which must be carried out in effecting the above-named purposes," nor are they hampered in the performance of such duties. Each man is a specialist in Japan, with little or no tendency to work in lines other than his specialty, and while the instruction which line officers receive in sanitation makes them very solicitous for the good health of their troops and generally painstaking in measures which properly fall to them for preserving it, they do not enter into any contest, as accomplished sanitarians, with medical officers. Due weight appears to be given also to the opinion of medical officers on any contemplated movement of troops, of which they are informed and for which they take part in conference. The final decision, as in all other military matters, of course, rests with the commander. Any friction between officers of different branches of the service would be entirely contrary to Japanese ideas

of patriotism, and all officers work harmoniously in the grooves fixed for them by regulations.

Apothecary officers.—Such officers, which we do not have, are found in the Japanese service. The limits of age for their appointment are the same as those for surgeons, and they are chosen and commissioned in practically the same way, coming from either the universities or schools, or from among the licentiates of the Home Department. Students receive an allowance, as do medical officers. Apothecary officers serve a four months' probationary period, about one month at a regiment and the rest at a hospital. The subjects taught in this course comprehend (1) hospital service, (2) surgical instruments, and (3) military sanitary chemistry. During this period they, like surgeons, are treated as officers, but also, like them, have the rank between that of special sergeant-major and sergeant-major. They are appointed to the grade of second lieutenant and are advanced, as are surgeons, except that they can not obtain a higher rank than colonel. There is a reserve of apothecary officers, members of which are called out for maneuvers, as is the case with surgeons. In the present war it has been necessary to commission new reserve apothecary officers. At the outbreak of the war, 96 apothecary officers are reported to have been in active service and 404 in the reserve.

Their duties, as prescribed in the Medical Department Field-Service Regulations, are care of medical supplies, preparation of medicines, oversight of chief nurse and other nurses, necessary chemical examinations, and care and repair of apparatus and instruments, with the exchange of those which have become useless. Thus, it will be seen, they have many duties performed by the first-class hospital sergeants in the United States Army, with somewhat broader functions. Very careful analyses are made of all drugs bought for the army and also of food supplies, when this is necessary, and it is here that these officers perform their most valuable duties. The Japanese do not use very many tablets, so that preparation of medicines is much more complicated than with us, and apothecary officers spend practically all their time in the dispensaries and storerooms, leaving the superintendence of work of the nurses in the wards to the medical officer in charge of them. Usually the apothecary

officer of a hospital is in charge of the photographic work, and some of them make excellent pictures of professional interest. They are always subordinate to a medical officer, except in supply depots, in which they may be in charge, or if the depot has several departments, in charge of their own section. In the main supply depot at Tokyo they manufacture many of the medical supplies for the army. So far as can be judged, they are competent pharmacists, and they certainly labor early and late in their dispensaries. There is some difference of opinion in Japan as to the necessity for commissioning such officers, but it is difficult to see how they could be dispensed with unless medical officers performed many of their duties, or the class of men taken as chief nurses was decidedly better educated in pharmacy than is the case at present. As will be seen at another place in this report, the allowance of apothecary officers in some of the large hospitals was a very liberal one, though, with the Japanese method of careful local examination of drugs and of dispensing, it is not thought to have been too great.

Dentists.—Dentists are not provided for under the Japanese Medical Service Regulations, but in practice some dental attendance is furnished the army at government expense. It was stated that some high-class dentists were employed and sent to the front, but there certainly must have been very few of these. In a conscript army, such as that of Japan, however, there was no particular difficulty in selecting fairly good men from the ranks. These, at first, had no instruments, but this was remedied after a time in some of the divisions by obtaining a suitable outfit from Japan. At best the plan was a makeshift, and as it was not possible to take many dentists from the troops, the few selected devoted nearly all their time to officers, and though soldiers were by no means excluded from dental care, under the circumstances it was only possible to give it to them in urgent cases. At reserve hospitals a few dentists were employed, and some voluntary dental aid was given soldiers, mainly by the professors of schools and universities.

Soldiers.—Until after the Chinese-Japanese war there were no medical department privates in the medical organizations of the Japanese army, all such places being filled by military employees. This did not prove satisfac-



1. JAPANESE SANITARY SOLDIER IN WINTER UNIFORM, WITH FULL EQUIPMENT.



2. REAR VIEW, JAPANESE SANITARY SOLDIER, WINTER UNIFORM AND FULL EQUIPMENT.

tory, however, and a change was made, though there is no hospital corps at present in the sense in which the term is used in the United States. The following grades are provided for soldiers of the medical department: (1) First-class chief nurses, rank of sergeant-major; (2) second-class chief nurses, rank of first-class sergeant; (3) third-class chief nurses, rank of second-class sergeant; (4) nurse (kangoshu), first-class private; (5) assistant nurse, ranking under third-class private (kangosotsu).

The nurses with troops (kangoshu)—and this class was found in the Japanese organization prior to the Chinese-Japanese war—are a part of the regimental strength. In an infantry regiment, for example, such privates are taken in the proportion of one to each company. After conscription this man serves for one year, performing the duties of an ordinary soldier. He then goes to a division hospital, where he receives four months' instruction in nursing and two months' practice; this latter period may, however, in some instances, be at a regiment. After this he serves the remainder of his conscript service, a year and a half, as a nurse with a regiment, going then into the reserve. The private designed for a nurse from the next year's conscription goes through the same course, and so on, year after year. It will be noted that there is a six months' period, during which two nurses are on duty with a company—that is, the last six months of the conscript of the earlier year and the first six months of the conscript of the later year.

The assistant nurses (kangosotsu) are of quite another class. They are men who are not physically fitted to perform the duties of ordinary soldiers, as they fall below the requirements in some respect. They have quite as much or usually a little more intelligence and education than the ordinary conscript. Forty are taken in each division yearly; they serve one month with a regiment, receiving the instruction of a soldier, and three months at a division hospital and then go into the reserve. In this war kangosotsu have been permitted, if they showed that they were qualified to be promoted to kangoshu, to receive that grade.

Chief nurses are promoted from kangoshu only. After a nurse private has received his hospital instruction and practice, specially well qualified men receive further instruction

to fit them for chief nurses, to which grade they may be promoted after a minimum of three months, though the period is usually a year. They then return to their regiments for the remainder of their conscript service and go from them into the reserve. Chief nurses may also be taken, when they are exceptionally well qualified men, for seven years' service. They may elect to serve seven years, when entering the service, or may so elect after they have qualified as chief nurses; in either event, they pass through the course of instruction described above. Some chief nurses also remain in the active army after completing their three years' conscript service. Qualified privates may, on the termination of their three years as conscripts, make application for reengagement as chief nurses. Such candidates for medical noncommissioned officers receive about eight months' additional training in a hospital.

The teaching, so far as nursing is concerned, is wholly given by the medical department and is under the direction of the chief surgeon of a division hospital, captain surgeons, apothecary officers, and chief nurses being directly responsible for it. The instruction of assistant nurses, as will be appreciated from its brief duration, can not be extensive. Their primary military training consists of (1) reading; (2) explanation of Imperial Instructions for the Army; (3) instruction in rank and uniform of officers; (4) military salute; (5) gymnastic exercises and drill. Their course in nursing comprehends (1) summary of Medical Service Regulations; (2) summary of Geneva Convention; (3) summary of anatomy; (4) nursing; (5) application of dressings.

The nurses (*kangoshu*), under instruction at a division hospital, are taught with the candidates for medical department noncommissioned officers. The division surgeon appoints the instructor, usually a captain surgeon, and the chief of the hospital, chief nurses as assistant instructors; the latter officer is held responsible for the training and education and superintends the work of all the instructors. In case the practical work of nurses is given with a regiment, the senior surgeon on duty with it reports on them to the instructors. Candidates unfitted to complete hospital training, on account of ill health or for other cause, are sent back

to the regiment and replaced by other men. An examination is held at the end of the term of instruction and practice, and report is made to the chief surgeon of the hospital on the results. The latter then gives successful candidates certificates. The candidates for noncommissioned officers are instructed in the same way; with both, the ordinary training course is given and also special lessons for those best qualified to profit by them. Examinations are held, as a rule, every six months, with a report of the results to the division surgeon. A special text-book is provided for privates at a hospital, but some of their work is practical, consisting of application of simple dressings and of the care of patients. With chief nurses more advanced instruction is given, of the same general character, but with special reference to operating-room work; another book is provided for this. Chief nurses also receive careful teaching in clerical work. Neither nurses nor chief nurses are given drill for carrying patients.

Little can be said in favor of the methods pursued by the Japanese for the scientific training of either their chief nurses or nurses. This does not mean that they are not good soldiers, however. Under the Japanese regulations for the aid of wounded on the firing line, they are often exposed to terrible fire, and, according to all available reports, they have always behaved with the greatest gallantry in succoring their companions. In the hospitals they are faithful in the performance of their duties, and do not drink to excess nor take for their own use articles provided for the sick. As with the Japanese generally, their police is excellent, and the chief nurses perform their clerical duties rapidly and well. They are especially weak in operating-room work and do not perform their duties in the wards with any great degree of intelligence, though they strictly follow orders given them.

After a man passes into the reserve his instruction is by means of maneuvers, to which he is called out at regular intervals. The same man does not go to maneuvers on successive years, probably not oftener than once in three or four years. Maneuvers pertain to division administration and occupy about one month. This refers to the medical maneuvers, which are not a part of the general maneuvers. In the medical maneuvers an attempt is made to give as good an

imitation of war as possible; the various field stations are established, and men are collected and carried back to them just as if they were wounded. It is believed by the Japanese that in the recent war such maneuvers have proved their value for the training of the subordinate medical personnel.

In war a good part of the nursing service of the Japanese army is still performed by civilian employees; the volunteer civilian nurse is termed *kanbionin*. They are found both in the grades of noncommissioned officers and privates (assimilated rank). There is, of course, no large body of trained civilian nurses in Japan, and the great majority of employees are necessarily taught after being hired for the army. They perform such duties as they are able from the moment of their employment, undergoing instruction at the same time. The duration of this instruction naturally varies with the different grades, but, in general terms, may be said to be from one to four months.

Chief nurses and nurses may be employed with troops and with any of the medical department organizations. It is customary to have at least one chief nurse with each medical department organization in order that he may regulate the administration under the surgeon. *Kangosotsu* may be employed anywhere with medical department organizations, except at the front, where they are only used with field hospitals, which have a large number. Civilians are utilized only at the base and on the lines of communication. A great number of chief nurses, nurses, and assistant nurses have necessarily come from the reserve in the recent war. Such men were employed with the same organizations as were those from the active list.

In addition to civilians hired for duties in connection with administration and nursing, many others were employed in Japan for the various positions in a hospital not connected therewith, such, for example, as mechanics, laborers, boys, etc. Under the Japanese system a free rein is given to the employment of coolies, and in Japan many such have been in service, as has also been the case in China, the Chinese being used there.

While civilian nurses were, as a rule, wholly untrained when they entered the service, men for such positions could

generally be obtained in Japan in any required number, and the Japanese regulations permitting their free employment, when needed, proved of the greatest value to the medical department. The same may be said in reference to the employment of civilian personnel for the less technical duties connected with medical department organizations. This allowed soldiers, nurses, and civilians instructed in nursing to be used exclusively in positions for which special training was needed. In Manchuria shortages were not allowed to occur at the front, but at times the Japanese did not have enough soldier nurses available for the lines of communication. This was remedied in the latter part of the war by allowing civilian employees to be sent to Manchuria in greater numbers.

Equipment of conscript force.—The equipment of chief nurses and nurses in the field is similar to that of the infantry, without firearms, ammunition, intrenching tools, and bags for sand. Both carry the bayonet, slung in a sheath at the side. A pouch is also provided for each medical department soldier. These differ for the chief nurses and nurses. Chief nurses also carry a brass receptacle for boiled water. This is oblong in shape and is placed in a leather case, much like the cartridge box, and is hung from the belt to the rear. In addition, a few articles are carried in the knapsack. With the Japanese cavalry, sanitary soldiers use the cavalry equipment and their own equipment, as given above. Sanitary soldiers are not mounted, except with the cavalry.

The Japanese authorities state their battle losses in medical personnel for the entire war to have been as follows:

	Killed.	Wounded.	Total.
Officers.....	19	104	123
Soldiers.....			450
Total.....			573

Thus 2.5 per cent of the 4,517 medical officers who took part in the campaign were killed or wounded. This would give a rate of something like 10 per cent of casualties among the surgeons who actually served at the front and a much higher one among those who were on duty with the infantry,

which suffered more from the fire of the enemy than any other branch of the service.

It is not thought that the Japanese here take account in their battle casualties among soldiers of any except those serving as nurses or chief nurses, so if other soldiers on duty with the medical department were included the medical department losses would be much increased.

OTHER OFFICERS AND SOLDIERS EMPLOYED WITH THE MEDICAL DEPARTMENT.

Officers from the line or train command a few of the medical department field organizations, under the direction of division or line of communication chief surgeons, as the case may be. Line and train soldiers, under line, train, or medical officers, are also found in several such organizations. A few words will therefore be said here in reference to the position, training, etc., of such officers and soldiers, though minute description and discussion of the medical department organizations in question will be postponed till later in the report.

Sanitary companies.—Sanitary companies have a comparatively large number of line and train officers and soldiers. Their commanders and the commanders of their two litter bearer companies usually come from the infantry, though sometimes they are taken from the train. The question of the detail of line officers to the sanitary company is rather a different one from that of putting them with the other medical department field organizations where they are found, as with the former, the Japanese believe that a line officer, from his superior knowledge of tactics, will be better able to choose locations for dressing stations, and there are no tactical problems in connection with the latter. So far as could be observed, there was absolutely no tendency to detail line officers with the sanitary companies who were not equal to other line officers in military ability; in fact, such officers might come directly from a battalion on the firing line to a sanitary company, or vice versa. However, if any tactical knowledge was required in locating dressing stations it was hardly manifest, though a military genius could probably only have jammed them into the nearest

practicable Chinese village to the front, without reference to artillery positions. Moreover, in practice, division surgeons usually gave such close directions in regard to where dressing stations were needed that little opportunity for a choice of site was permitted their commanders. The only special instruction in peace which the commanders and the other line or train officers with such companies can have in regard to them is at maneuvers, as such companies are only formed then. It is hardly probable, of course, that officers with such companies, in war, would have ever been attached to them at maneuvers.

The regulations for training litter companies were promulgated in War Act 40, March 28, 1896. The object, as stated in that act, is to show certain soldiers how to carry wounded in the battlefield. It provides, moreover, that non-commissioned officers and privates of infantry and artillery will receive the necessary training. The number of soldiers to be trained each year is as follows: In an infantry regiment, one sergeant or corporal for a regiment, one lance corporal for a battalion, two privates and a trumpeter for a company; in an artillery regiment, a sergeant or a corporal for a regiment or an independent battalion, a lance corporal for a battalion, and a private for a company. The order requires that brave and strong men be chosen; the selection of noncommissioned officers is left to the regimental and battalion commanders, and of privates to the company commanders. As a rule, good men are chosen for litter-bearer companies, but not the best, as they naturally are wanted for noncommissioned officers of regiments. The instructors are appointed by the regimental commander. The following subjects are taught: Simple anatomy, general treatment of wounded, artificial respiration, how to check hemorrhage, dressing wounds, organization of litter company and drill of litter company. The duration of the training is from two to three months, and it is completed every year before the first inspection. Men taken for training are excused from guard and some other duties, and if it is necessary for any man to be relieved from the instruction, his place is filled as soon as possible. The regimental commander makes an inspection at the end of the instruction and gives certificates

to those qualified, reporting their names to the division commander. Afterwards occasional practice is indulged in for soldiers so trained. A lieutenant-surgeon or second lieutenant-surgeon and one or two chief nurses act as instructors, and examiners at the conclusion of the work, reporting the results to the senior surgeon of the regiment, who is responsible for superintending the training. As with Japanese instruction and drill generally, several hours, both morning and afternoon, are devoted to this work. After litter company soldiers pass into the reserve they are called out for maneuvers, together with those training in the active service, but it is not customary to so call artillerymen. The chief surgeon of the division is required to inspect and to criticize the service of the litter companies during maneuvers and to report on it at their conclusion to his division commander and to the Chief of the Bureau of Medical Affairs of the War Department.

There is no doubt but that the methods pursued by the Japanese in selecting these men result in a sturdy body of soldiers, who are competent to carry wounded for long distances. They are also from the fighting class and willingly undergo great dangers in collecting patients from the field, though in this latter particular they are not superior to the nurses, who, in fact, actually come from the same class. Their training in aiding the wounded is not nearly as good as that of the nurses, to whom, in practice, they leave almost everything except the actual bearer duties. In the recent war it was not possible to secure all the men required for litter companies from those who had received instruction, while in the active army, and some absolutely untrained men were taken, and extra litter bearers were added, at least in the Second Army, by the detail of train soldiers. Neither does it appear that the Japanese utilized their opportunities during the war for training litter bearers as fully as might have been done.

The equipment of such soldiers corresponds to that of the infantry, without the rifle, etc. Dressing pouches, of a model similar to the nurses' pouches, are carried by the bearers.

Company bearers.—Company bearers are selected, as a rule, from men on the active list who have had the training

above specified. This was not absolute, however; some untrained men were used for company bearers in the artillery and infantry, and they were also detailed in organizations for which they were not provided under the regulations. The supposed difficulty of obtaining company bearers during an action, on account of the unwillingness of company commander to permit such men to leave the firing line, was not apparent in the Japanese army. It would be preposterous to believe, of course, that a company commander would take company bearers out of a fight when, in his opinion, their services were absolutely necessary there, but the Japanese certainly desired to get the wounded back and out of sight of the other men as quickly as possible, and almost universally advantage was taken of the services of the company bearers to accomplish this.

Department for transporting patients and division medical supply depots.—The two other medical department organizations where both officers and men of the line were regularly employed were the department for transporting patients and the division medical supply depots. In the former, when reserve officers were used, they were of the younger class and were active in the performance of their duties. Greater difficulties were experienced in the division supply depots, where a number of the old reserve officers who were in command did not always sufficiently appreciate the necessity of expedition in supplying the front, moreover some of these officers had passed the active age required for such positions. The men employed in these two organizations and some of those in the sanitary companies were train soldiers, without medical department instruction, nor did their duties require such training. The field hospitals and the Sanitary Reserve Personnel also have soldiers of the train, who serve under the command of the medical officers in charge.

In some of the battles of the war the number of wounded at certain points was so great that the medical department was unable to remove them, and regimental or brigade commanders sent whole companies, under their own officers, to collect and to carry them to places of comparative safety.

While the greatest harmony always apparently prevailed between the line officers in command of the medical department units and the medical officers subordinate to them, and

the other medical officers of high rank, who directed their operations, there is little doubt but that the Japanese would have preferred to have had medical officers, if they had been available, for commanders of the department for transporting patients and for the division medical supply depots. As has already been stated, the tactical questions in the location of dressing stations put the sanitary companies on a different footing, and these seem so much more important to the Japanese than they do to an observer that it is hardly probable that they would put medical officers in command of these units even if they could obtain them as easily as they can line officers.

INTENDANCE DEPARTMENT IN ITS RELATION TO THE MEDICAL DEPARTMENT.

Officers of the intendance department and their assistants, who are noncommissioned officers of the same department, perform an important rôle in the medical organizations of the Japanese army. Intendance officers are assigned to nearly every medical organization, where they purchase food, medicines, instruments, etc., hire transportation, and pay personnel and patients. All this is done under the orders of the medical officer in charge of the special organization concerned, who himself estimates for the money required for the various purposes and only gives it to the intendance officer as needed for current disbursements. This method serves to take a great deal of the burden of administration from the shoulders of medical officers, as intendance officers keep all the money accounts and procure the supplies, examining them on receipt to find there are no shortages in delivery. In the field intendance officers were constantly busy procuring food, and went long distances to make purchases when such articles could not be bought locally. The regiments even have intendance officers so that in emergency medical supplies may be purchased, with the approval of the regimental commander. It should be noted that intendance officers only act as purchasing agents and do not at all dictate what the purchases shall be, this devolves wholly on the medical officer in charge of an organization, who also determines whether the quality of medical supplies, food, etc., is satis-

factory. Troops are paid every ten days in the Japanese army, and patients in hospital usually bring a certificate from the regiment, giving their last date of payment, so there is no delay in giving them their money. When men return to their regiments, or rather divisions, from a hospital, if railway fare is involved, this is furnished by the hospital intendants officer. The officers of the intendants department assigned to medical department organizations nearly always belonged to the reserve, and were frequently business men in civil life. It is believed that the intendants department was well qualified to perform the duties which fell to its share with the medical department. Certainly, having intendants officers at medical department organizations enabled the latter to conduct their own affairs without calling on other departments for assistance, and fixed responsibility as could have been done in no other way.

DEPARTMENT OF COMMUNICATIONS AND TRANSPORTATION IN ITS RELATION TO THE MEDICAL DEPARTMENT.

The above-mentioned department has already been rather fully discussed in reference to the army as a whole; a few words will, therefore, suffice to describe its peculiar relations with the medical department.

At the beginning of the war, with regiments, battalions, batteries, squadrons, etc., transportation was furnished for all medical department personnel and their regulation supplies, which accompanied them. This was also the case with the medical department field organizations, so far as was practicable with the available sea transportation. It was not, however, always possible to send all such organizations with their divisions; for example, at Nanshan, there was some shortage in the field hospitals of the Second Army. This was very soon remedied. In rail or sea transportation, a medical department organization was never split up, nor was it separated from its regulation supplies. This was the case at the beginning of the war as well as afterwards, when new organizations were sent out.

Medical personnel, sent to Manchuria during the course of the war, either to fill "death holes," as the Japanese call vacancies caused by casualties at the front, or for the lines of

communication, were forwarded from their divisions to one of the points of embarkation, usually Ujina, and thence were transported to Manchuria, either by transport, or by hospital ship, when it was necessary to relieve pressure for accommodation on the former. Medical supplies for Manchuria were turned over for shipment to the department of communications and transportation, which brought them to Ujina or Moji by rail and placed them in separate storehouses, afterwards promptly consigning them to the Manchurian storehouse, by transport, not by hospital ships, whence they went by rail and cart transport to the branches of this storehouse and finally to the army storehouses.

Besides the duties of this department in connection with transportation of medical department personnel and materiel it also furnished trains and ships for patients. As these are of more interest in connection with the latter department, their detailed description will be postponed for the present.

Under such an organization as the Japanese, the medical department is made absolutely responsible for everything in connection with the care of sick and wounded as far as possible; in fact, the only other department on which it must depend for aid to any extent, outside of its own organizations, is the department for communications and transportation. Fortunately for the army as a whole and for the medical department as a part of it, the Japanese department of communications and transportation was thoroughly competent. The Japanese have not that familiarity with and ability in operating railroads that they manifest with ships, to be sure, but they managed to run their railroads sufficiently well to get up their personnel and supplies promptly, and their large fleet of instantly available subsidized ships proved wonderfully effective. There was very little confusion in shipping medical personnel and supplies, and there were no losses of such property, and it was not mixed with articles belonging to other departments. Neither was there apparently any shortage of medical supplies at the front on account of prior necessity of getting up food and ammunition. This was true even during the latter part of the war when the Japanese were compelled to work their single-track narrow-gauge railway, with small cars, to its utmost capacity.

VOLUNTARY AID.

Voluntary aid is extremely well organized in Japan. In fact, the methods by which the energies and money of the people are utilized to advantage in this direction might be safely accepted as a model by any nation.

At the forefront of the organizations for aiding sick and wounded soldiers is the Red Cross Society of Japan, which is such a powerful organization that it hardly brooks competition in its own field.

The object of the Red Cross Society, as stated in its articles of association, is to care for the sick and wounded at the heat of war. It may also undertake the relief of injury or disease caused by natural catastrophies or other disasters. The fact that its primary aim is that of caring for sick and wounded soldiers in war should be noted. Nothing is allowed to interfere with this. General charitable work is not undertaken by the society, and what is accomplished in this direction is incidental, mainly as a means for training its personnel. Neither do public calamities play more than a secondary part with it. Relief work in them, according to a statement made by the Red Cross, is only undertaken, first, to respond to the humane wishes of its patron, Her Majesty the Empress; second, to exercise the relief staff of the society under difficult circumstances; and third, to utilize the occasion as a means of propaganda for Red Cross work and of making the inhabitants of the country take an active part in it. The society does not appropriate funds for the relief of distress in public calamities, but local sections, in case of need, are permitted to use their personnel and supplies temporarily, being enjoined to see that this does not interfere with the real service in time of war. Aid in such cases is administered through the relief corps of the society, entirely at the expense of the local sections concerned.

The origin of the Red Cross Society was in the "Society of Benevolence," founded during the civil war in Kagoshima in 1877. The Government having subscribed to the Geneva Convention in 1886, the society connected itself with the International Society of the Red Cross at Geneva, changed its name to "The Red Cross Society of Japan," revised its regulations, and in 1887 participated in the "International Con-

ference of the Red Cross." During this same year a plan for participation in war was arranged with the Minister of War, and a beginning was made in collecting necessary funds for this purpose. Not much was accomplished, however, until the Chinese-Japanese war, when the aid given the army medical department by the Red Cross met with imperial and popular approval, and the number of members, and coincidentally the funds, increased rapidly. After the war there was no pause in this, and in 1904 the society had over 900,000 members, nearly one forty-fifth of the entire population; the last publication of the Red Cross gives the number of members as 1,035,000. The total income for 1903 was more than 2,965,300 yen, and early in the war the capital was reported to be 8,418,018 yen.

Under the new civil code of Japan, promulgated in 1898, a legal status was given the organization, which is now incorporated as a juridical person under that code. "It is under the special patronage of their Majesties, the Emperor and Empress, and has as its honorary president a Prince of the Imperial Family, who is accustomed to take an active part in promoting its interests."

The members of the society are of three classes, viz: Honorary, special, and regular. The government is vested in a standing council, which is composed of thirty counselors elected by a general assembly of the members resident in Tokyo; the names of those elected must be approved by the Emperor. The affairs of the society are taken charge of by eight to ten managers, who are elected by the standing council from its own members. One such manager is elected president and two, vice-presidents. The Emperor also approves the names of these officers and those of the managers.

The standing council meets monthly, or oftener, to discuss and to decide upon society affairs; the execution of their decisions is left to the managers. The president directs the general affairs of the society, appoints commissioners, and engages employees. He presides at the general meeting and at the meetings of the council. The vice-presidents assist the president and take his place in the event of his disability.

Three controllers are elected by the general assembly and are approved by the Emperor. They keep watch on the

finances of the society and report to the general assembly if they find anything wrong.

"Besides the headquarters in Tokyo, in Hokkaido, the 47 prefectures and Formosa are instituted local sections, whose personnel consists partly of the officials of the local governments and partly of the functionaries ad hoc of the society. They are assisted in their work by a council composed of members who are influential citizens in the locality. The bureaus are established either in a portion of the local government office itself or in separate buildings belonging to the society. In the cities and districts, or subdivisions of the prefectures, there are instituted local committees, and the mayors are nominated their chiefs, just as the prefectural governors are nominated chiefs of the local sections. The cordial support of the Government has thus enabled the society to make use of the Government machinery for the completion of its organization. This fact has been a great factor in the rapid growth, the prestige, and the effectual building up of the society."

While the society is actually governed by its standing council, its acts are subject to the approval of three of the cabinet ministers. "They are subject to the approval of the Minister of the Imperial Household in order that they may conform to the wishes of the society's Imperial patrons, and they must be passed upon by the Ministers of War and sometimes of the Navy in order that they may be consistent with the needs of the public service.

"The military control over the society is exercised by the Chief of the Medical Bureau of the War Department. To render this effective, a staff officer and an army surgeon are detailed as counselors of the society. By such an arrangement the proper spheres of the official medical corps and that of the society are clearly demarked, homogeneity of methods and materials is secured, and good understanding and harmonious cooperation are vouchsafed.

"Noteworthy points about the Japanese Red Cross organization are its very high degree of centralization and its close relations with and willing and unquestioning subjection of all matters of policy to the views of the Government department with which it collaborates."

In time of peace the Red Cross organization is principally occupied in gaining new members, collecting funds, and, of great importance, in training its working personnel. The working personnel of the society consists of administrators, managers, clerks, chief physicians, physicians, pharmacists, women chief nurses, women nurses, men chief attendants, men attendants, and stretcher bearers. Special regulations now govern the recruitment of this relief staff: These require all applicants to be of good physique, to be exempt from military service, to be of good moral character, etc. As the administrators are appointed on the outbreak of war or of political disturbance, no special qualifications are fixed for them beforehand. Special qualifications are required, however, for all the other positions. Persons appointed become the reserve physicians, attendants, etc., of the society. Each is required to take a vow, a solemn oath, to keep himself or herself for a fixed number of years, different in the various classes, ready to respond at any time for service with the society in time of war, political disturbance, or for instruction in maneuvers, etc. The number of years over which the vow extends differs with the position. It may be extended on expiration, if the physical condition of the applicant warrants this. If the age limit be reached before the vow period is over the individual is dismissed, unless, on physical examination, he is found capable of further service. During the continuance of a war or a political disturbance a person may be held by the society even if the period of his vow has expired. For keeping the vow, independent of any service rendered, the managers, physicians, pharmacists, attendants, and stretcher bearers in reserve receive small detention fees. The chief nurses and nurses receive nothing, as they have a fine field for employment on account of their training, which has been a great expense to the society.

Whenever members of the reserve personnel, under vow, are called to render service in time of war, etc., or are summoned for maneuvers or instruction, they receive a fixed amount, the so-called "departure money," and their expenses for traveling, besides the salary, which is much better than that paid to members of the Army medical service. Length of service and difficult service both command additions to

salary, and pensions are paid for illness contracted or wounds received in consequence of service.

No technical training is given administrators, managers, and clerks, as they do not require it, nor do pharmacists receive any, as the number required is so small that they are easily obtained from professional druggists.

In the case of physicians, the society makes a contract with some of the students of the imperial universities and pays the expense of their education on condition that they become reserve physicians of the society on graduation. Then they are usually attached to the central hospital of the society, where they are required to practice under the supervision of Baron Doctor Kashimito. After a certain number of years some of these physicians are sent to Europe to perfect their studies. A great many physicians are, however, obtained after graduation from schools other than the imperial universities and from licentiates of the Home Department. This latter class has a special course of lectures which are given from time to time, usually in the central hospital of the society. The president nominates chief physicians from among the reserve physicians.

Candidates for nurses are taken from women between the ages of 17 and 30, who become, after an elementary mental examination and a physical examination, student nurses of the headquarters or of a local section. They have three years' training, either in the hospitals of the society, where such exist, or by a specially instituted training board. Local sections, at their own expense, are permitted to intrust the education of their student nurses to the hospital of the society, or even to private hospitals. A small fee is paid each student nurse, and uniforms and other articles are loaned to them. Those passing the examination, at the termination of their three years' course, are taken up at once as reserve nurses of the society under vow. Six months' supplementary training for the better prepared of these nurses is required in the central hospital of the society to fit them for chief nurses. During the period of peace the nurses accept private employment. To regulate this a board is in existence at the central hospital in Tokyo.

Candidates for attendants come from men between the ages of 20 and 34, who undergo an examination similar to

that for nurses. They have but ten months' training, which is given at the same places above noted for nurses. They also have an allowance, slightly higher than that for nurses, and the uniforms, etc. Their last five months are spent in practical exercises in army hospitals. This is considered very important, as it gives them an idea of military discipline and of the organization of the army medical service. They, like the nurses, on passing the final examination successfully, are appointed under vow. The more competent are fitted for chief attendants by two months' more instruction in the central hospital. It is believed that, as attendants find little employment after graduation, they must be given frequent exercise in maneuvers, relief service in case of public calamity, etc.

Candidates for stretcher bearers must have been trained as bearers when infantry soldiers or if such men can not be procured in sufficient numbers, must at least have been infantry soldiers. Each must be below 37 years of age and must have the guaranty of two persons for his good conduct. Their selection depends upon their physical fitness. They receive three months' training in transporting sick and wounded and in making ropes, stretchers, etc., which it may be necessary to use in connection with their service. All stretcher-bearer students are now trained at the headquarters of the society, where they receive a small amount of money, uniform, etc. On completion of their three months' training course, they may go directly into the reserve or may take a supplementary course, in the case of those best qualified, to fit them for chief stretcher bearers, then going into the reserve. The society complains that, as stretcher bearers find little employment as such outside the society, it is difficult to recruit them.

"In time of war the president is empowered to change or shorten the time of training fixed for the nurses, attendants, and stretcher bearers."

In order to complete the education of the Red Cross personnel, the army permits it to take part in maneuvers. During these exercises the society or its local sections call out and send their relief staffs as in time of war, establishing hospitals on the lines of communication to receive patients and to care for those who have really been injured or suffered

from illness during the maneuvers. The chief medical officer on duty at the maneuvers criticises their conduct at the end of the exercises.

The entire working personnel of the society is divided into certain detachments, each of which pertains to the headquarters in Tokyo or to a local section. These relief corps consist of the five following organizations: (1) Relief detachments; (2) transport columns; (3) hospital ships; (4) rest stations; (5) depots of supply.

The relief detachments have for their purpose the giving of assistance to the army medical staff of hospitals, either at home or on the lines of communication. The standard adopted for the personnel is that considered sufficient for 100 patients, and is as follows: Two physicians, 1 pharmacist, 1 clerk, 2 chief nurses (or chief attendants), 20 nurses (or attendants). In 1904 there were 112 such detachments for the army and 4 for the navy. Of the former, 94 were formed with nurses and 18 with attendants. It was planned to use nurses at home and attendants on the lines of communication.

The transport columns, of which there were but 3 in 1904, are organized for transporting 30 patients in a specially serious condition who will require medical treatment during the period of transportation. Each column is formed as follows: One manager, 1 physician, 1 clerk, 2 chief attendants, 2 chief stretcher bearers, 3 attendants, 150 stretcher bearers.

The next organization is that of hospital ships. While the Red Cross Society has only two such ships capable of carrying 200 patients each, they intend to construct two more, each for 100 patients, and so have organizations for these as well as for the two ships now owned by them.

The organization for a hospital ship for 200 patients is as follows: One manager, 4 physicians, including 1 chief physician, 1 pharmacist, 2 clerks, 2 assistant pharmacists, 2 chief nurses, 2 chief attendants, 20 nurses, 20 attendants.

The hospital ship for 100 patients has the following personnel: One manager, 3 physicians, including 1 chief physician, 1 pharmacist, 1 clerk, 1 assistant pharmacist, 1 chief nurse, 1 chief attendant, 10 nurses, 10 attendants.

In case of war a mechanic, an interpreter, a barber, and a washerman may be added to the personnel of each class of ship.

The fourth organization is that of the rest station. It is intended that these be located at ports of disembarkation and at railway stations between the ports and the hospitals at home. They alleviate the suffering and fatigue of patients by affording them rest and refreshment, and also medical treatment in case of need. The president of the society, with the approval of the Minister of War, fixes the foods, drinks, etc., to be offered to patients, but the local section of the place where the rest station is situated determines its organization and supplies such physicians, clerks, nurses, etc., as may be necessary.

The fifth and last relief corps is termed the depot of supply. It is intended to establish this on the lines of communication where the supplies and contributed articles for the relief corps of the society on service on the lines of communication may be best received and distributed. Only one such depot is ready in time of peace, as it is thought that others may be formed at once on the outbreak of war. Its personnel consists of 1 manager, 1, pharmacist, 2 clerks.

While it is not the purpose of the Japanese Red Cross Society to furnish materiel to the extent that this is done in some other countries, yet a few supplies are furnished each relief corps, a fixed amount being established by a table. During peace these supplies are stored in godowns, both at the headquarters and at the local sections of the society.

In order that the relief corps may be promptly mobilized, the president of the society draws up two reports of all the preparations made for the coming year for the service of the society and presents them to the Ministers of War and of the Navy before the end of September of the previous year. On receiving the reports the ministers assign to such relief corps as are needed fixed services with the army and navy in case of war, and the relief corps to which definite positions in the system of mobilization have thus been allotted can not be used for any other purpose during the year.

Special regulations stipulating the way in which relief corps are to be mobilized in time of war or for the purpose of review, maneuvers, etc., are executed at the headquarters

and local sections, and orders are printed and stored, so that only the date, name, and time and place of formation of the relief corps have to be filled in before dispatch. A separate list is also made of the distances to the residences of the different members of the corps, so it may be known how many hours are required for orders to reach them. On receipt of such orders they must acknowledge receipt of the summons and whether they can respond to the call. In case they are prevented from doing so by illness, this answer will be accompanied by a physician's certificate. Members responding to a call are subjected to a physical examination and, if found incapable of service, are immediately sent home.

In time of peace the Red Cross Society maintains its central office in Tokyo and its local branches. It has also a large permanent central hospital at the capital, three small permanent hospitals at Nagano, Miya, and Shiga, respectively, and a large administration building and land for a hospital at Hiroshima. It is intended to establish other hospitals. As the primary object of the society is not charity, but the aid of sick and wounded in war, while some charity patients are taken in its hospitals during peace, payment is required from the majority.

As stated above, the society owns two hospital ships. These boats were built on the Clyde, their construction being completed in December, 1898. The plan of construction was determined upon by a technical committee, of which the directors of the medical service of the army and navy were members. Their building was confided to the Nippon Yusen Kaisha, which bought them from the society, the terms of the sale requiring that, whenever the society needed them, they should be placed at its disposal without delay. Thirty days are allowed to transform them into hospital ships in ordinary times, but only seven days in war. While in use by the society, the company receives the same price per ton as is paid by the Government for ships taken by it.

In time of war the Red Cross is only employed by the order of the War Minister, the necessary number being selected by the Inspector-General of Field Sanitation, who directs them as far as the performance of their duties is concerned. They are, however, under military discipline and command, being under the orders of the commander in chief of the

lines of communication, division, etc., as the case may be. It is not intended that Red Cross personnel be employed at the front, and, as far as known, they have never been so employed during the recent war. Their duties are confined to the lines of communication and to home service. In time of war, the regulations provide that the general administrator of the society shall be stationed at Imperial Headquarters, and will direct the relief service of all the relief corps sent out on the several lines of communication. This direction is exercised through administrators on these lines of communication. The general administrator oversees the work, fills vacancies and attend to the pay and allowances of the personnel on the lines of communication. The administrators supervise the work, each on his own lines of communication. As a matter of fact, in time of war the Red Cross Society is practically merged into the army medical department, and its personnel is used just as that of the latter department. The administrators only attend to the pay and allowances of their personnel and supply their wants. The Central Hospital in Tokyo in time of war becomes a branch of the reserve hospital, and Red Cross personnel is only found alone on the two hospital ships belonging to the society.

The report of the Red Cross Society, presented at the Universal Exposition, St. Louis, in 1904, gave its then strength as follows:

Administrators	5
Clerks	87
Physicians, including chief physicians	314
Pharmacists	124
Assistant pharmacists	5
Chief nurses	156
Nurses	1, 677
Chief attendants	55
Attendants	713
Stretcher bearers	150
The number then under training was:	
Nurses	558
Attendants	4
Total	3, 848

The work done by the Red Cross Society in the Russo-Japanese war has been described in two reports published by

that body. As the latter of these covers the period till September, 1905, they practically give an account of the entire war. "The two hospital ships were made ready for service as soon as instructions were received from the army, the names of the vessels being intimated to Russia by the authorities, in accordance with the rules of the Hague Convention. The *Hakuai Maru* sailed from Ujina on the 21st of February, 1904, and the *Kosai Maru* on the 25th of the same month. Since then both have been engaged in the transportation of patients between the different ports in Korea and Manchuria and Japan. The Central Hospital in Tokyo, on the outbreak of war, was immediately appropriated to the use of the army as a branch hospital of the Tokyo Military Reserve Hospital. Many additional structures, principally wards, have been erected for the former since the outbreak of war. At Hiroshima the land owned by the society has been put at the disposal of the army, which has erected a temporary hospital on its site. Seventy-eight relief detachments have been dispatched to the naval and military hospitals at home, and 32 have been sent to Korea and Manchuria. Nearly all of these have served with the army. In addition, 38 relief detachments have been assigned for service to the hospital ships owned by the army. One depot of supply has been established on the lines of communication, and one transport column has been located on these same lines. In addition to these institutions, 13 agencies at home and 1 at the front have been organized in order to facilitate the management of the relief detachments, numbering 152 in all, and of the relief stations established at ports and railroad stations." These stations have had as their working personnel members of branches of the society and surgeons, nurses, and members of the Ladies' Volunteer Nursing Association, to be spoken of later.

The society reports that it has sent out more than 4,700 nurses, both male and female, from which personnel, with the necessary additions to complete them, five relief detachments have served wholly in Russian prisoners' hospitals and stations. The approximate amount of the expenses for Red Cross work up to the end of the year 1905 is estimated at 5,150,000 yen.

In the recent war sister societies contributed both money and personnel to the Red Cross. The Red Cross Society of Germany, with the permission of the Japanese Government, sent out two eminent surgeons and a nurse, who, from March, 1905, till October of the same year, conducted a military hospital in Sendagaya, Tokyo. A party of American nurses, under Mrs. McGee, was utilized from May to October, 1904, principally at Hiroshima, but also on hospital ships and at Matsuyama and in Korea. A Mrs. Richardson, an English lady, also did some work, mainly in the Tokyo and Hiroshima hospitals.

In 1887 the Ladies' Volunteer Nursing Association of the Red Cross Society of Japan was established, which, under its constitution, is attached to the Japanese Red Cross and is under its supervision and protection. At the end of the war this association had 41 branches, which, together with the headquarters, numbered nearly 10,000 members, including princesses, the wives of the nobility and of diplomatic staffs, and other distinguished ladies. Many of these ladies, including some of the princesses, have studied nursing. In time of war they make bandages and caps for patients, furnish part of the personnel at relief stations, visit hospitals, help patients to write to their families, and distribute books, magazines, etc., which they have collected. They may actually nurse the sick, if necessary, and may afford them aid in various other ways. The greatest work of the ladies' association has been to raise the position of the Red Cross nurses by making the dignity of their work appreciated. "The traditional position of women in Japan left a considerable prejudice to be overcome in this respect. The patronage of the Empress and the cooperation of the committee of ladies have been the means of bringing about the good results achieved in this direction." The army authorities believe that the voluntary services of the lady members of this association have much improved the morale and discipline of the hospitals generally.

Undoubtedly it has already been noted that the Japanese Red Cross Society, contrary to the custom in some other countries, devotes itself mainly to providing personnel and not materiel. Whether such exclusive attention to personnel

would be desirable in all other nations may, of course, be questioned. The point is, however, that the Japanese Red Cross learned from the army what it would need and went systematically to work to furnish this, and not something else which might or might not be useful.

There is no doubt but that the carefully thought-out organization of the Japanese Red Cross Society proved of incalculable value to the army medical department in the Japanese-Russian war. Consider for a moment the primary requirements of a voluntary aid society to render it most efficient in affording aid to sick and wounded in time of war, and it will be seen that the Japanese Society of the Red Cross had such requisites inherent in its organization and administration.

1. A society for voluntary aid for sick and wounded must be so administered as to gain and retain the confidence of its members and the public generally, or funds will not be forthcoming, and the vast sums required for it will not be on hand.

2. A society must be imbued with the highest spirit of humanity—so high that in the accomplishment of its primary object it must be willing to sink petty jealousies.

3. A society must recognize that a special department is made responsible by law and regulations for the aid of sick and wounded, and its patriotism must be such that its efforts will be directed to the assistance of that department and not to a separate administration, which, while perhaps more satisfactory to the fancied dignity of individuals in a society, has never failed in practice to result in overlapping of effort, surplus at one point and deficiency at another, and extravagance.

4. A society must have on its board of governors or in another responsible position representation from the army which is empowered authoritatively to indicate the direction which training of personnel should take and what materiel should be collected.

5. A society must make arrangements for the training of personnel on lines which will make it effective for army use.

6. An army medical department must know, in the event of war, what aid in the way of personnel and materiel a society is ready to supply.

7. A society must know what will be done with **its** personnel; in order that it may be instantly dispatched on mobilization.

8. The services of personnel with an army must fuse with the existing organization of the medical department of **that** army or confusion will result.

9. The personnel, while in the service of the army, **must** be under military discipline and command.

Several societies were also established during the war for the relief of soldiers' families and for like purposes. The principal one was the Ladies' Patriotic Association, of which Prince Kania was the head. It was an excellent organization, but its discussion is hardly believed to be within the purposes of this report.

While voluntary aid for sick and wounded soldiers, so far as societies were concerned, was practically confined to the Red Cross and to its Ladies' Association, naturally, in a contest so near the hearts of a whole people in its objects as the recent one, much voluntary aid was offered individually. A number of university professors, court physicians, and ordinary practitioners of medicine volunteered their services to the Minister of War and these were sometimes accepted. Civilian practitioners were utilized almost entirely in reserve hospitals, but some of the professors were sent to Manchuria for investigations in their special lines. They were treated as high civil officers. Under the law reasonable allowances are made to such volunteers while they are in the service, but some of them who were well to do refused to accept anything from the Government. The volunteers have all worked under the Chief of the Medical Bureau of the War Department. While their desire to assist their country in the hard trial through which it was passing is, of course, deserving of nothing but praise, their services can not be said to have been of any great value. To this statement an exception should be made in the case of some of the specialists, whose volunteering enabled the Government to secure the best material available in Japan for certain lines of work. The people generally also made many gifts to sick and wounded soldiers besides those sent through the Red Cross. Such presents, designed for Manchurian troops, were sent to the War

Department, which used its own discretion in reference to forwarding them. At home people in a division district not infrequently made gifts to their hospital. These were received and accounted for by the hospital director of the place in question, who usually placed them in a recreation room, where all patients might have access to them.

Some remarks have already been made on the ability manifested by the medical department of the Japanese army. This subject may now, therefore, be completed by discussing the professional ability displayed by this department as a whole, including its active and reserve lists, the Red Cross, and other voluntary aid. While, perhaps, no country has ever utilized so large a proportion of its medical talent in war as has Japan in her recent conflict, it can not be successfully maintained that such talent was of a very high order professionally. Japan is a young country, which still requires time to develop practitioners of medicine and surgery comparable in ability with those of other nations, in which study of these subjects has been the labor of many years. Full discussion of the practice of medicine and surgery will be found under the proper headings; the different conditions which obtained in regard to the practice of sanitation in the army have already been described.

In all places where Red Cross personnel was employed—that is, at reserve hospitals, at convalescent camps, on hospital ships, and at hospitals on the lines of communication—it fused so perfectly with the army medical department personnel that it was almost impossible to tell where one began and the other ended. However, the surgeons of the Red Cross, though many of them were said to be eminent practitioners in civil life, were only on a par professionally with the army medical officers. The Red Cross attendants were, perhaps, as a class, slightly better qualified for nursing duties than were the army attendants. The Japanese army has no woman nurse corps, all such nurses being supplied by the Red Cross. While their training does not compare favorably with that of women nurses in America, they are much better qualified than are other nurses in Japan. Their cheerful performance of duty, under the frequent discomfort from which they suffered, is to be commended, as is also their

general willingness to make themselves useful in necessary tasks, which were not, in all instances, strictly connected with nursing. At home, in war, practically all scientific nursing devolves on these women. Formerly they were not permitted to care for cases of contagious disease, as, until the passage of a recent law, there was no provision for pension to their families in the event of their death. They are now found employed in the contagious disease wards and in those containing the most serious cases of illness and injury, as well as in the operating rooms, where, under direction of the surgeons, they do everything except operations, dressings, and the rougher police work. No women nurses were permitted in Manchuria, as the Japanese deemed this impracticable on moral grounds.

Since the close of the Russo-Japanese war the Japanese authorities have made the following official statement in reference to medical personnel employed by them during that conflict:

Army:

Medical officers	4, 517
Apothecary officers	(63)
Sanitary soldiers	33, 753
Red Cross	5, 470
Professors, etc., volunteers	230
Foreign surgeons	2
Sister of charity	1
Total	44, 621

The total number of surgeons was 5,131. Members of the Ladies' Aid Association are not included.

Unfortunately this statement does not answer some important questions, as it is not known what the Japanese include under the term "sanitary soldiers." It is thought, however, that only conscripts and civilians employed as nurses and chief nurses are represented here, and that all soldiers of the intendance and train and all civilians not employed in duties connected with nursing are excluded. Obviously, if these were included, the number would be a much higher one. Moreover, none of the line, train, or intendance officers on duty with the medical department are shown in the table.

MATÉRIEL.

The matériel of the Japanese medical department may, in general terms, be said to correspond closely to that of other civilized nations; that is to say, while hospital construction, transportation, and the like are in a measure peculiar to Japan, they, as well as all articles having to do with the actual practice of medicine and surgery, are modeled on western, not on eastern lines.

Nearly all articles used in the care and treatment of sick and wounded, in the broadest sense, are furnished by the medical department. A very few are, however, supplied by the intendance department, and the transport of the medical department, though in the field its regulation allowance is permanently assigned to it, as has been stated, comes originally from another department, as do also hospital trains and ships. The medical department itself furnishes all medical supplies, preserved foods for the sick, instruments, apparatus, sanitary appliances, hospital corps pouches, litters, medical department tentage, beds, etc. Hospital clothing and blankets for the sick and clothing for the personnel are obtained from the intendance department. The personal ordnance equipment of the men of the medical department is made at the arsenal, but everything in this line, except the bayonet, is distributed through the intendance department. This department also performs one other most important function in reference to medical department matériel, as it is directly responsible for the construction of hospitals. The transportation assigned to the medical department in the field comes from its division train depot. Hospital trains and ships are provided by the department of communications and transportation.

The supplies bought and made by the medical department itself, for the front and lines of communication came almost entirely from the medical supply depot in Tokyo. Those for the army at home were generally purchased or manufactured

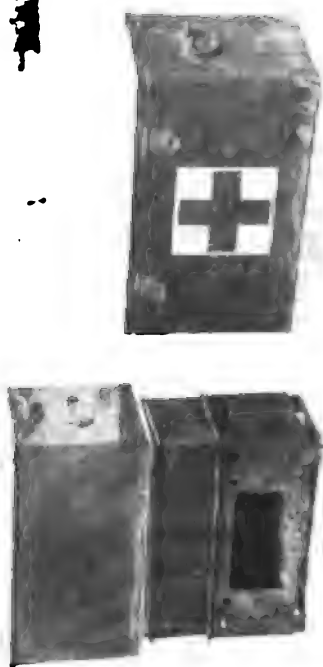
at the division hospitals. As the Japanese desired to scatter the money expended for army supplies at as many points in the Empire as possible, the main depot secured articles which it required from a number of different cities. Osaka was the principal market after Tokyo. Some of the reserve hospitals not only procured articles for their own needs, but also supplied those for other medical department organizations; for example, the reserve hospital in Hiroshima furnished the medical supplies for all the hospital ships plying to that port.

In time of peace, the Japanese do not contemplate the accumulation of great quantities of supplies for the medical department, as these would deteriorate in storage. They do, however, have articles on hand sufficient in amount to outfit completely their field medical organizations. Except for these and a small quantity at the various hospitals, supplies are purchased for the army during the course of a war.

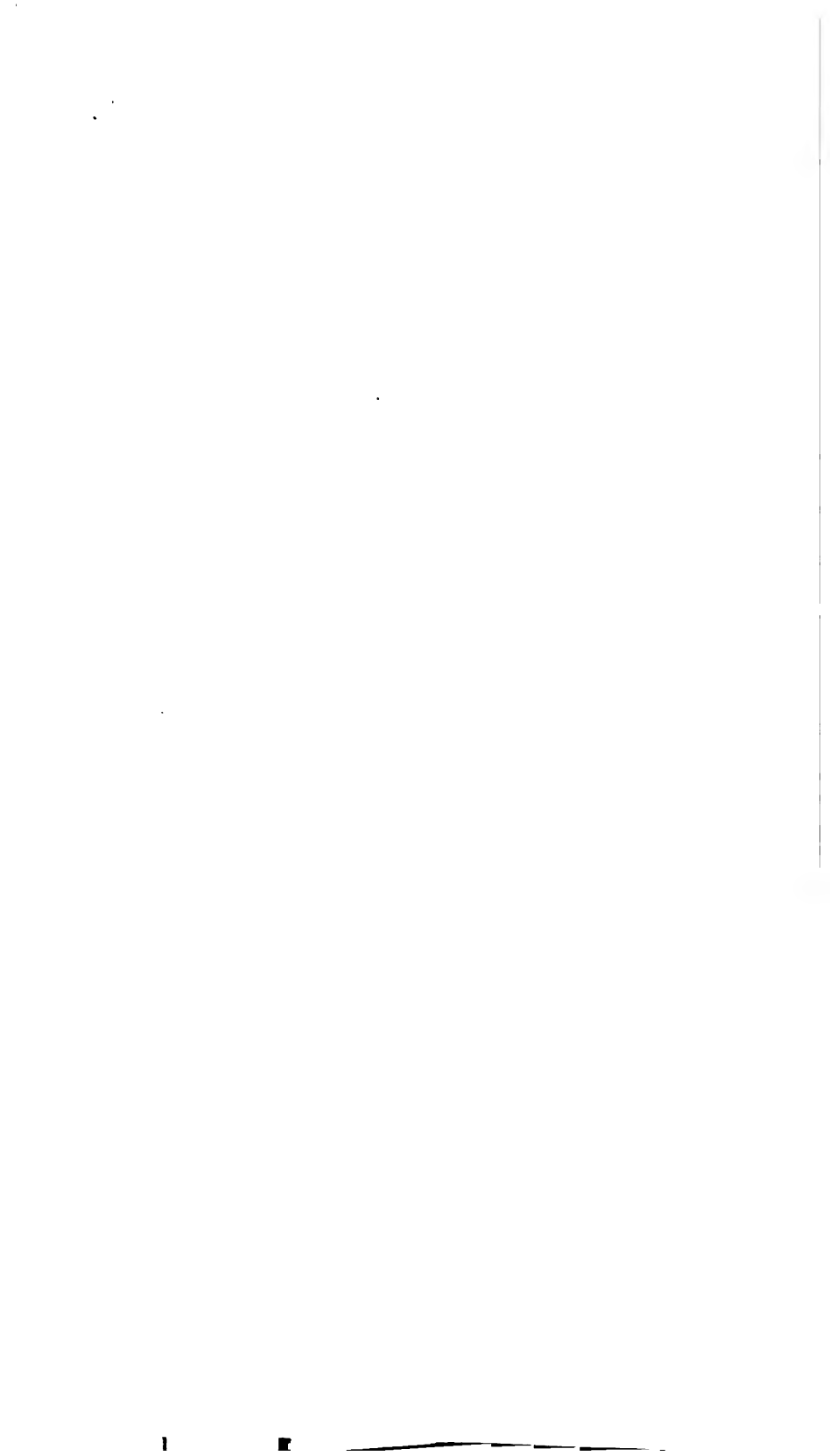
Great attention is given in all departments of the Japanese army to inspection, with analyses, when necessary, of all supplies bought or manufactured, and much care is taken in medical department depots and hospitals, where supplies are purchased or made, that they conform to the standard fixed, which is a high one.

For the medicines furnished by the Japanese medical department reference may be had to the supply tables. It will be seen that few tablets are used. Such supplies are therefore much more bulky than with us. The tablets and pills are almost all made by the department. The machines used are crude, and many processes are performed by hand. It is thought that the small flasks for hypodermic solutions are very convenient for the field, where it is often so difficult to obtain clean water to dissolve tablets. With this exception there are no preparations of medicines in use by the Japanese which merit consideration, though, of course, their careful analyses of all drugs should be commended.

Their dressings are practically the same as ours. The large quantity of gauze, etc., which was required for dressings in the field is noteworthy. The first-aid packet of the Japanese is a bad one. It hardly seems that, at the beginning of the war, they appreciated how absolutely essential for the successful treatment of wounds a good first-aid packet is.



3. FIELD STERILIZER FOR INSTRUMENTS AND DRESSINGS, SET UP.





4. FIELD STERILIZER FOR INSTRUMENTS AND DRESSINGS, SHOWING PARTS.



The packet in use did not contain enough gauze, only three small pieces, which were so badly folded that it was almost impossible to apply them to a wound without soiling them by handling, and, when applied, they were so small that they were easily displaced, more especially as there was no circular bandage to hold them firmly in position. The triangular bandage in the packet was of the usual type, and in this the Japanese, of course, followed the practice of other nations, though it seems doubtful whether it is necessary to furnish this triangular bandage, which, in fact, in the field is usually doubled up into a scarf by the user, and could probably be replaced to advantage by a gauze roller bandage. Some of the Japanese packets possessed another bad feature in that they had a layer of protective for application outside of the gauze. It is but fair to state that the Japanese themselves appreciate the deficiencies in their first-aid dressing and were at work in October at the main supply depot in Tokyo investigating packets adopted by other nations with a view to improving their own. They stated that the greatest difficulty they found with the present packet was that it had no impermeable cover, and they looked with special favor on recent United States packets with such a covering.

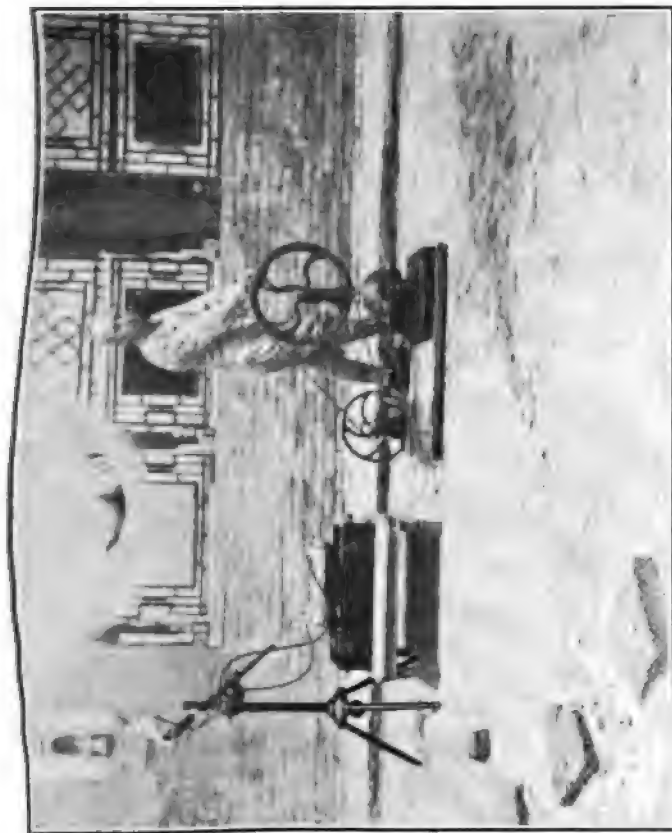
The Japanese use a light oiled silk of their own manufacture, which folds into extremely small bulk and is convenient for protecting the bed or table when making dressings. They also make a good plaster of Paris splint by rubbing wet plaster into strands of hemp. No instruments were seen which merit special description. Their large field-operating case is almost identical with ours. The surgeon's instrument case is an excellent one. It is much more convenient than ours, as it may be carried in the pocket. It contains all necessary instruments which are capable of sterilization in the case itself. The small coaptation splint carried by the nurses is fairly good. Plaster of Paris was not used extensively in the field. The Japanese stated that they found that it broke and softened, and they attempted to varnish splints made with it, in order that they might not be affected by wet, but this only proved moderately successful.

One of the very best pieces of medical equipment used by the Japanese was the portable field sterilizer for instruments

and dressings; this apparatus is small, light, and is well designed for its purpose. Its bags for dressings are too heavy and too closely woven, however. The portable field operating table is a good one. It can, if necessary, be carried on a pack saddle. Among the field hospital supplies the Japanese have a small case, with oilstones, strops, etc., for sharpening instruments. This would prove valuable for field medical organizations. There was also another case of apparatus, reagents, etc., to be used for the chemical analysis of water. How valuable such analysis would prove, under the conditions of active service, is, of course, an open question, but the case itself is convenient and sufficient for the purpose for which it was designed. At the latter part of the war the Japanese supplied field hospitals with another much more elaborate apparatus for analyzing water. This was packed in two chests, which were well arranged. One of the four field hospitals of a division carries apparatus for bacteriological work and another an X-ray apparatus, though the latter was not much used in practice, it gave such good illumination that foreign bodies might easily have been located with it.

The hospital corps pouches both for nurses and chief nurses are much alike. They are made of a heavy canvas, with a cloth partition through the center and a pocket in the flap. The canvas is treated with paint, so as to make it impermeable to water. A good idea is embodied in the pouch, in that the edges are brought in with a small steel bar, riveted at both ends, so that water can not run in at the sides of the top. The metal receptacle, containing boiled water, carried by the nurses is so small, holding hardly more than a pint, that it is not practicable to furnish drinking water for wounded from it, nor is it intended for this purpose, but for the giving of medicine. The question of our nurses carrying a large canteen of water may require consideration, but it is not thought that with us any water is needed with medicines.

The steam sterilizer for disinfecting clothing, bedding, etc., is a good apparatus, but might be improved without adding materially to its weight by having a double instead of a single skin. As now constructed, it is not possible to



5. X-RAY APPARATUS SUPPLIED TO ONE OF THE FIELD HOSPITALS OF A DIVISION.



6. POUCHES OF NURSES AND CHIEF NURSES.

dry articles in it after they have been subjected to disinfection.

A number of different appliances were used for the sterilization of water during the course of the war. A picture is furnished of the regulation boiler for water, and photographs are also given of many of the other articles of medical department equipment which are described here. As the water boiler was set up on a small Japanese transport cart, it also constituted a portable water tank, which followed the troops. These boilers are manufactured in the large arsenal at Tokyo. Information received from the commander of that establishment was to the effect that he had issued them in numbers sufficient for two per infantry company. A filtering apparatus for the chemical sterilization of water was furnished the army in the summer of 1905. It was called the Ishiji filter, from the name of the maker, and the process was held a secret. All these different apparatuses are discussed at length under the head of sanitation.

Medical supplies for the field are packed in boxes of six prescribed sizes; any of these may be handled by one man. The field chests are of two classes, both of which may be carried by pack animal; one is used with battalions and other troop organizations. This is of the style of the ordinary field trunk of the Japanese officer. Some improvements were made in this chest, in the way of strengthening it, in those issued at the latter part of the war, but it has nothing to recommend it except its lightness. The other type of chest is used both at field hospitals and with sanitary companies. It is of rattan, with a strong leather cover. Within the chest itself is an inner metal case, which contains drawers, compartments, etc., in which the various articles are packed. This chest is a good one, capable of standing much rough work. Little difficulty was experienced in furnishing a sufficient quantity of medicines from these chests, but before a battle every available space had to be filled with dressings.

A small amount of tentage is furnished field medical organizations by the medical department. During the winter it was only used for storage, etc., as the weather was entirely too cold then to quarter patients in tents. In the summer,

however, tents were occasionally employed as operating rooms and were preferred by some surgeons to the dirty Chinese houses. The Japanese tent is an extremely poor article, but an extra sheet was supplied with some of them for a floor cloth, which proved of value in keeping down dust and dirt in tents used for operating rooms. The Japanese used several types of litter. Of these, three are recognized by the regulations; the Annan, the old pattern folding litter without legs, and the new with legs. The Annan is practically a small box, with squared wooden sides and a burlap bottom, the burlap being continued up some distance at both ends to terminate in loops. Through these loops a long pole is passed, which rests on the shoulder of one bearer before and one behind. A modification is made by having two jump sticks instead of one long pole. In this case four bearers are employed, two before and two behind, a short jump stick resting on the shoulders of each two men. It is necessary, with this litter, to take a sidelong motion. This arrangement proved far the more comfortable for the patient. The trot of the Chinese bearers carries the litter almost without up-and-down motion; in fact, it is the type generally employed for carrying sick long distances in China. The nearness of the patient to the ground was a desirable feature, and the method of carriage by a pole on the shoulders was apparently easier for the Chinese than the employment of slings. These litters did not have legs ordinarily, though they were sometimes attached to the board sides.

It was not intended that the litter just described should be used at the front during battles, the folding litter being exclusively relied upon for such service. The weight of the latter litter with legs was intended to be about 16½ pounds. In this respect it had therefore some advantage over ours. Another point in its favor is that if braces, legs, and bed are supplied it is possible to improvise poles. This was done to a very large extent in Manchuria, principally by taking curtain poles from Chinese houses. The litter without legs was of this same type and requires no particular description. The Japanese believe that litters should be provided with legs. Their folding litter has not stood service well, and they recommend that stronger construction be



7. FIELD STERILIZER FOR BEDDING AND CLOTHING.



8. TYPE CHEST USED BY SANITARY COMPANIES AND FIELD HOSPITALS; ALSO REGULATION PACKING BOXES OF THE MEDICAL DEPARTMENT.





9. FIELD CHEST, SHOWING SURGICAL CASE.

adopted throughout. If bamboo is used, they consider it necessary to carry about 20 per cent of additional poles. Some surgeons recommend that wood replace bamboo. An improvised bamboo litter made at Hiroshima, though not strong, was light and cheap and answered well for transfer of patients about a hospital. The medical department also employed a wheeled litter, not for use at the front, but principally at the reserve hospitals and somewhat on the lines of communication. It does not permit the patient carried to lie flat, therefore its use was rather restricted, as most patients for whom it could be employed could sit up in an ordinary rickshaw. There would be no difficulty, of course, in making its bed more nearly horizontal. It was found necessary to provide covers for litters to protect the patients from rain, snow, and sun. These covers were also used to screen patients in Chinese carts. Such covers should certainly be provided in our army. The Japanese have not accomplished much with horse litters, though they found that they required them for cavalry and made some for this service. The question of supplying sufficient hand litters and splints at the front during a battle proved a difficult one. It was found necessary to carry many more than the regulation allowance of litters, and extra splints were also in great demand. The methods which the Japanese pursued, of having all litters provided by the medical department and such articles in the custody of that department only, worked well in practice.

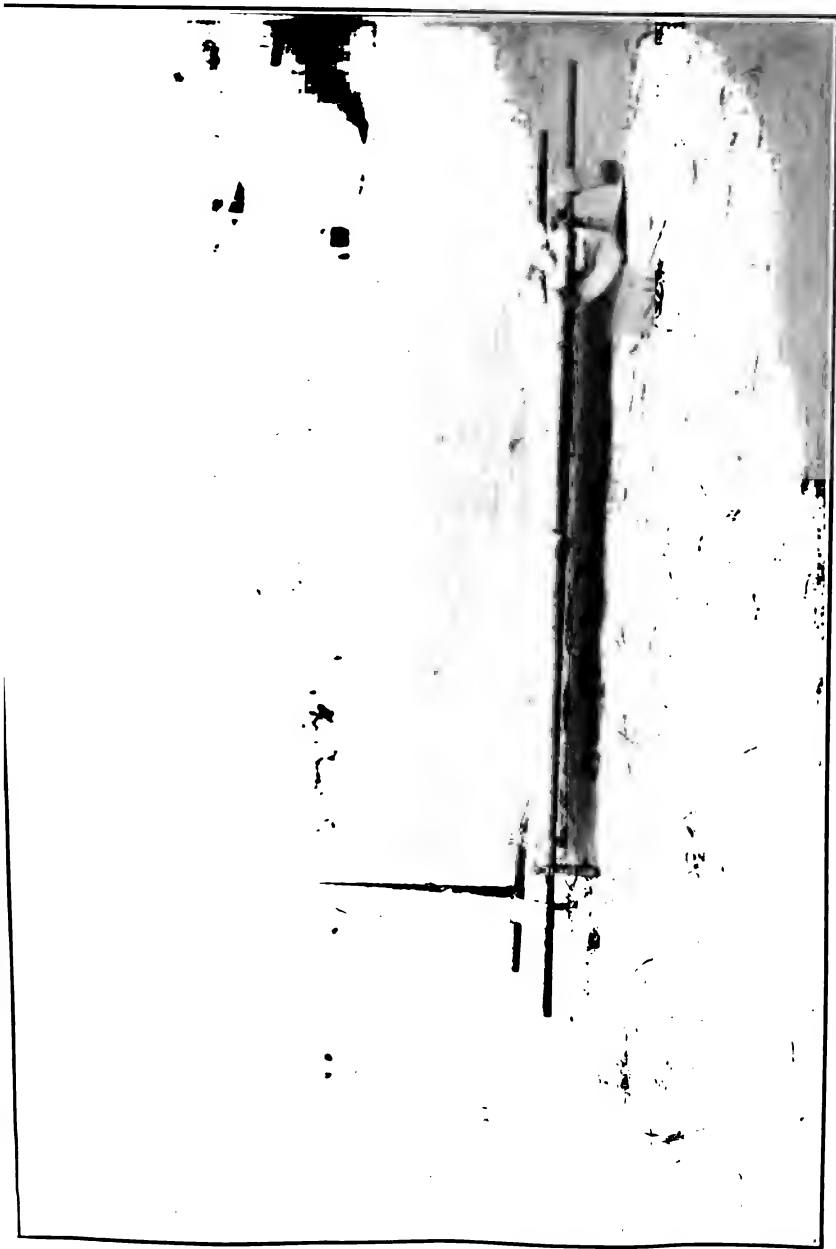
The channels through which requisitions are made for articles furnished by the medical department and for hospital clothing, etc., from the intendants department are described in the Field Service Regulations of the Medical Department. Mention should be made of the fact that requisitions are not the sole means of obtaining property for medical department organizations. For example, division chief surgeons, by regulations, are informed of contemplated movements of troops, but naturally do not desire to give such information to their subordinates. The former are also acquainted with the amount of supplies that field hospitals, etc., have on hand from their frequent reports, and, especially before a great battle, habitually add to them such

articles as they think will be needed. Extra transportation is furnished in the same manner, without requisition, after consultation with the chief of staff of the division.

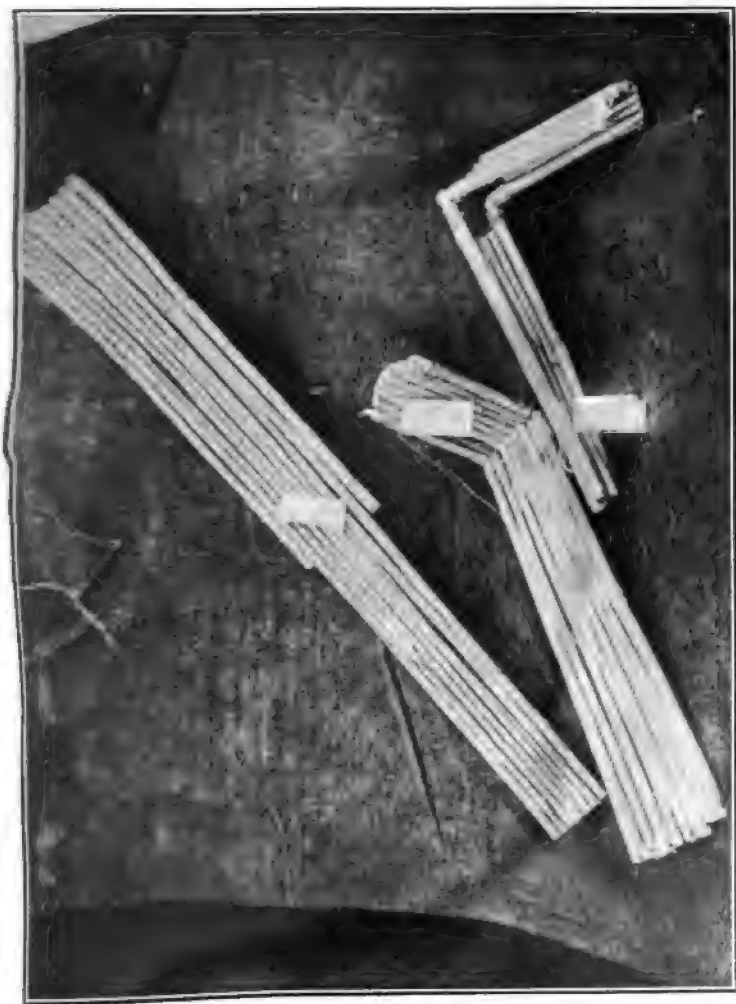
Local purchase of medical supplies, though provided for even in regiments by regulations, was not often resorted to in the field. In fact, only one instance of such purchase was seen personally. This was on the line of communication of the Second Army, where some hyoscyamus was bought from the Chinese under the direction of the chief surgeon, and preparations were made from it in the laboratory. It is understood that a considerable amount of alcohol was distilled in division supply depots from Chinese brandy, which was easily bought.

At the front, medical property which is susceptible of repair is first sent to a field hospital. If this can not make it serviceable, it goes farther to the rear and may even be sent to Japan if it is sufficiently valuable and repair can not be effected nearer. The same course is taken with property on the lines of communication, except that a line of communication hospital is substituted for the field hospital. At home division hospitals habitually make all needed repairs. The ultimate destination of all property which can not be sooner repaired is the main medical supply depot in Tokyo. Property damaged beyond repair and lost property is dropped by the responsible officer certifying to a detailed statement in a book kept for the purpose. The simplicity of this method certainly recommends it.

The hospital clothing and blankets for patients, which, as has been stated, are obtained from the intendance department, at home are commonly issued from a division storehouse, to which they are sent from the main clothing depot in Tokyo or from one of its branches. In the field, both came from the main depot to the Manchurian storehouse, where they went to the medical section and thereafter remained in the custody of the medical department. Clothing for the personnel is from the same source and is issued divisionally. The personal ordnance equipment of the men, except the bayonet, is sent from the arsenal to the main intendance depot or to one of its branches, and is issued by one of the latter. The bayonet goes from the arsenal to a division arms depot, which issues it. The plan of having a



10. REGULATION LITTER.



11. SPLINTS MADE OF KAOLIANG AT FIFTH DIVISION, SECOND ARMY.

special dress for patients is a good one. This is always worn until a man is returned to duty. The dress consists of a white cotton kimona, with or without wadding according to the season, a hat of the same material, and a suit of crape pajamas. The first two are marked with the red cross, and officers and noncommissioned officers each wear a special insignia on the left sleeve of the kimona.

The commanders of reserve hospitals in Japan make plans yearly for the constructions which they will require during the following year in case war occurs. Plans and estimate of cost are prepared by the officer in charge of construction at division headquarters, receive the approval of the division commander, and, later, that of the War Department. Contracts are then let at the division, and bids are invited and accepted, so that in the event of war it is only necessary to call upon the contractor to make the necessary constructions at the accepted price. If, after war is begun, it is found that more buildings than have been contracted for are required, the same course is taken to obtain approval for them; but all this is done by telegraph, and the contracts are let immediately. In the field a different method is pursued in hospital construction. There a board is appointed, of which the director of the hospital is one member, which determines what constructions are necessary at the place in question. The officer in charge of construction then proceeds to put up such buildings and to do any leveling, filling, etc., which may be required. Japanese coolies and Chinese were generally hired for this work, but soldiers were used in certain cases. When the necessity was great, and medical department field organizations were not required for their proper work at the front, their personnel was also employed. The intendance department also supplied the reserve hospitals at home with a small amount of furniture, such as tables and chairs.

A certain allowance of transportation, including animals (riding, pack, and draft), carts, saddles, harness, etc., is prescribed for each medical department field organization. This is furnished to each such organization on the outbreak of war from its division train depot, and losses are replaced through this same depot. As has been stated, transportation and coolies, in addition to the authorized allowance, are freely hired as needed by medical officers in command of

organizations, their intendants officers paying for them. Transportation belonging to the train is often temporarily devoted to medical department use, either to bring up supplies to a depot or to carry wounded to the rear during an action. It should be understood, of course, that such transportation does not pass from the control of the commander of the train to the medical department.

The animals were not, of course, of high grade, but they were as good as any obtainable in Japan. The pack saddle was well adapted to its special purpose. It would be difficult to find a saddle more simple and cheaper than this, and, in practice, no sore backs resulted from its use. No expert packers were required to load it. While it is true that each pack animal in the Japanese service was led by a soldier, and that therefore the pack saddle was not given a test on animals running free, medical supplies in any army are of such character that it would not be safe to intrust them to a free animal, and the Japanese pack saddle filled all requirements for a medical department. The transportation cart, while the only one practicable for the Japanese with their poor animals, has the serious objection that it can only carry a load of a little over 400 pounds. It is convenient, however, for certain purposes and knocks down well for transportation. The Chinese carts, on which the medical as well as other departments of the Japanese army largely depended, are good vehicles, carrying from 1,000 to 1,500 pounds.

As has been stated, hospital trains and ships are provided by the department of communications and transportation. General arrangements for them, as will be seen later, are made by the Chief of the Medical Bureau of the War Department. No hospital trains, such as are described in the Field-Service Regulations of the Medical Department, were operated during the war. In Japan hospital cars and ordinary coaches for less serious cases were attached to ordinary trains as needed. They were converted third-class coaches. It is difficult to make good hospital cars for narrow-gauge roads, which are universally operated in Japan, as the space between the berths on the two sides is so limited that much trouble is experienced in handling seriously sick patients on litters. As so many soldier patients were returned to their divisions in Japan, large train accommodation for them was neces-



12. REGULATION METHOD OF PACKING BATTALION MEDICAL CHESTS AND LITTERS.





13. BATTALION KETTLES AND IRON PLATES FOR FIELD KITCHEN PACKED ON REGULATION SADDLE.



sarily provided. In Manchuria no hospital cars of any description were run, open trucks and box cars returning from the front being solely relied upon for patients. In fact, even if the Japanese had desired to do so, it would have been impossible for them to have operated any hospital trains in Manchuria, as they did not have the rolling stock and it was difficult for them to meet the primary necessity of supplying their armies at the front without the interference of hospital trains. It is rather strange, however, that the Japanese, who had apparently complete plans for converting ships for hospital purposes, made no attempt to fit cars for patients, the more so as they must have known long before the war what their railway transportation must be and were certainly familiar with the arrangements other nations have adopted.

None of the vessels taken for a hospital ship was of great tonnage, the larger subsidized European liners of 6,000 tons register having been appropriated by the Government for use as transports. The subsidized ships for hospitals averaged between 2,500 and 3,000 tons and carried from 250 to 450 patients. They did not compare favorably with the *Relief*, and the Japanese, who saw her in China, consider her to have been a model ship for hospital purposes, but stated that they did not require so elaborate an equipment, as their ships were not used as floating hospitals, but only as transports for patients. The general plan adopted for the army hospital ships was to clear them out entirely, except the cabins, and then to utilize the latter for officer patients and to put temporary bunks in all available space on the decks and sometimes in the hold for soldiers. A number of temporary deck houses were also erected for extra kitchens, sterilizers, mortuaries, etc. The forward part of each ship was separated from the remainder so that it might be used for the isolation of cases of contagious disease. This, of course, was not the best place for such patients, but the Japanese found it much easier to separate them in a forward compartment than aft, where they should have been. Two or more cabins were thrown together for an operating room. Providing a sterilizer for bedding and clothing on each hospital ship was a good idea, and the Japanese surgeons consider that by the untiring use of such apparatus much infected material was prevented from reaching home ports. On these ships the

poor facilities for operating were probably most deserving of criticism. No separate rooms for changing dressings and for operating were provided, and the operating rooms were not well adapted to their purpose, nor were they particularly well furnished. As wounded were evacuated very rapidly from the front to Japan, lack of good facilities for surgical work was severely felt. Some of the hospital ships had been on commercial service in the Tropics, and in them the heating arrangements were insufficient. The two Red Cross ships were built for hospital purposes and were therefore better than the army liners, but they are also lacking in operating-room facilities and have such narrow passageways that it is difficult to handle patients on litters in them. Some of the large liners—they are said to have been six in number—were used to transport patients. They were not specially fitted for this purpose, however. At the home ports large sampans, some of them capable of carrying 50 patients lying down, were employed to trans-ship sick and wounded from the hospital ships to the shore.

There is no question but that the Japanese authorities desired to provide the medical department of their army liberally with all articles which it needed; in fact, to have done otherwise would have been regarded as a breach of good faith. That they succeeded in accomplishing this purpose does not admit of doubt. Medical supplies were not only bought or manufactured in ample quantities for the troops, but also, what is a very different thing, they were furnished liberally at the front, as well as at the rear.

Of strictly medical supplies the quantity was always sufficient, and enough variety was provided for army use. Naturally, in the reserve hospitals, many more drugs and preparations were on hand than was the case in the field.

The blankets and hospital clothing provided by the intendance department were furnished in sufficient quantities, and the methods for their distribution proved satisfactory.

No shortage occurred in the clothing or equipment of the personnel.

Field transportation was on correct lines—that is, pack animals for temporary dressing stations with troops, other pack animals for sanitary company dressing stations of divisions, and small carts for field hospitals are the best



4. TYPE, SLED COMMONLY USED FOR THE TRANSPORT OF WOUNDED ON THE HUN RIVER,
BATTLE OF MUKDEN.

means of transportation for such organizations. The authorized allowance of medical transportation with battalions was barely sufficient, and it was therefore doubled in battles. Neither was the transportation permanently allotted to sanitary companies and field hospitals enough, though far more liberal than in many armies, but the easy methods to augment it by hiring locally, provided for in the Japanese regulations, proved wonderfully effective in practice.

The carrying of supplies to the front by transport temporarily assigned for medical department use was well done, and the necessity of allowing the medical department to use transportation freely in getting wounded back during the progress of a great battle was appreciated by commanders generally.

The buildings for reserve hospitals were erected with the greatest celerity, some of these wooden structures being made ready for patients in less than three days. These buildings, while they did not compare favorably with the permanent hospitals in the United States, nor in Japan, for the matter of that, were well suited for their purpose. They were so far superior to tents that it would be ridiculous to spend time in comparison. On the lines of communication good buildings were always taken for hospitals when such were available. These were then promptly altered to fit them for hospital purposes. Some few good hospitals were also built here.

The hospital cars in Japan answered their purpose well. The hospital ships, though—as already stated, they were far from ideal vessels for their purpose—did not give bad accommodation. The special merit in the Japanese system in this particular was the rapidity with which they were able to fit up a large number of such ships on the outbreak of war. The hospital fittings for certain subsidized liners are stored in Ujina in peace times ready at hand for skilled workmen there, who adapt a designated ship for a hospital in much less than a week. The Red Cross Society stores its fittings at the same place and is equally well prepared. The sampans were found fairly comfortable for patients during the brief time they were occupied en route from ship to dock.

MEDICAL DEPARTMENT ORGANIZATION.

In this discussion, beginning with the War Department and Imperial Headquarters, each medical department administrative office will be described, with the organizations subordinate to it. At the end of the text schemes and tables show the details of organization, including personnel and supplies. This subdivision of the subject concludes with an estimate of the medical personnel in service with the Japanese army during the recent war.

As preliminary to this discussion, it should be stated that administrative officers of the medical department generally were in close relation to their commanding officers, and that, subject to commanding officers, their control of their own department was complete. With those questions which always arise in war, for which neither regulations nor custom provide, decision, if they can not be settled by the medical department, is left to the chief of staff of the organization affected. In practice, the latter officers apparently approved medical department recommendations and requests as a matter of course. It should be mentioned, however, that all medical officers in the higher administrative positions were men of intelligence and experience, hardly likely to be unreasonable or impracticable. Medical attendance at each headquarters is regulated by the chief surgeon, but no attendance is provided for other than the military organization—that is, the families of officers and soldiers receive no medical service from the Government. Unless something to the contrary is said, it may be understood that matters at the various headquarters were conducted on practically the same general lines as those described in discussing the Chief of the Medical Bureau of the War Department. It has not been thought necessary to quote exhaustively from the Japanese Field Service Regulations for the Medical Department. These should be consulted, however, if sufficient explanation is not given in the text.

ADMINISTRATIVE OFFICES OF THE WAR DEPARTMENT AND
IMPERIAL HEADQUARTERS.

At the head of the medical department is the officer in charge of the Medical Bureau of the War Department, who, on the outbreak of war becomes *ex officio* the principal medical officer of the armies in the field, with the title of Inspector General of Field Sanitation. This officer has direct access to the Minister of War and to the Chief of Staff. His opinion is constantly sought on all matters of medical interest both by the Minister of War and by the Chief of Staff, and he is admitted to councils of war and given an opportunity to express his views. The officer at the head of the medical bureau also has frequent consultations with the chief of the department of communications and transportation and with the chief of the intendance department. The army medical school and the main supply depot of the medical department are directly under him, and, in consultation with the chief of the department of communications and transportation, he makes necessary arrangements in reference to hospital ships and trains. He determines when the services of Red Cross personnel will be taken advantage of and to which points they will be sent at home, also arranging for others to go to the lines of communication. On affairs concerning his own department he communicates directly with, and receives reports directly from, chief surgeons of divisions at home, chief surgeons of the lines of communication, and army chief surgeons. He may supply medical personnel to fill vacancies at the front, and habitually arranges to replace those who have been incapacitated from any cause on the general lines of communication. Sick and wounded returning from the front are usually sent as soon as possible to their divisions, but when they must be forwarded elsewhere for any cause this is arranged by the chief of the medical bureau. When it is necessary for any reason to have a division furnish medical supplies for other organizations, this is regulated by the same officer. The Chief of the Medical Bureau of the War Department makes estimates for funds required by his department and also submits an annual report on its operation. During the recent war as the Inspector General of

Field Sanitation he made at least two inspecting trips to Manchuria, in which he thoroughly investigated all subjects of interest to his department, advising medical officers generally, and reporting on what he thought necessary to the War Department and to the Chief of Staff on his return.

The organization of the office of the Chief of the Medical Bureau of the War Department follows:

In the Bureau of Medical Affairs two departments shall be established—the Sanitary and the Medical. In the Sanitary Department the following affairs shall be transacted:

1. Obtaining sanitary personnel and their education.
2. Assignment of sanitary personnel.
3. Hygiene with regard to clothing, food, buildings, water, etc.
4. Prevention of infectious diseases.
5. Sanitary reports, statistics, and records of the training of sanitary personnel.
6. Army medical school.

In the Medical Department the following affairs shall be transacted:

1. Hospitals and convalescent camps.
2. Sanitary supplies.
3. Physical examinations.
4. Discharge for disability and pensionable cases.
5. Medical supply storehouse.

In order to conduct the affairs of his office, the chief of the medical bureau has two assistants, a colonel and a captain, and a large force of clerks. During the war some use was also made of the staff of the army medical school, which was closed. No office was maintained at Imperial Headquarters, but the chief of the medical bureau went there for consultation or direction, and carried on the work connected with his dual post in his rooms at the War Department—subjects falling to the proper section of that office.

The present incumbent of the office of Chief of the Medical Bureau of the War Department is Surgeon-General Koiki, who has recently been given the rank of lieutenant-general.

Throughout the recent war three medical inspectors permanently performed duties under the Medical Bureau of the War Department. One of these was stationed at Tokyo and the other two at Hiroshima. All were officers of long service and one was a lieutenant-general. At Hiroshima one of these medical inspectors took charge of the medical work principally and the other of the surgical. Their duties were



15. MAIN MEDICAL SUPPLY DEPOT, TOKYO.

confined to the hospitals, troops being inspected by the division surgeons. Special medical inspectors were sent to Manchuria as required. Throughout the Japanese army the careful inspection of medical department organizations by experienced officers of that department is to be commended.

Both the medical supply depot and the army medical school have already been referred to.

The military quarantine stations at Dairi and Niroshima were War Department and not divisional organizations, a special quarantine department being established at the War Department. The chief of the medical bureau regulated the administration of his own department at those stations with the chief quarantine officer. The stations are described at length under sanitation.

The hospitals for Russian prisoners were also departmental and not divisional organizations. Matsuyama, on the inland sea, was, during a large part of the war, the only hospital for prisoners. Many sick and wounded Russians were, however, treated at the other military prisons. The medical service at Matsuyama, and probably at the other points where prisoners were confined, was under the direct control of the Chief of the Medical Bureau of the War Department. The care and treatment of prisoners of war was notably good, and the medical service furnished them was quite equal to that supplied to their own soldiers by the Japanese.

Hospital trains, as stated above, were arranged for by the Chief of the Medical Bureau of the War Department. Details in regard to the running of these trains were, however, left largely to the division chief surgeons of the places from which they started and to the station commanders. As no regulation hospital trains were operated, it is hardly necessary to discuss them. In Japan sick and wounded were carefully selected for transportation by trains carrying patients. During it they were made comfortable, and sufficient attendance was always provided, invariably including a medical officer, with necessary equipment, etc., to care for ill and injured, whose well-being was also much promoted by the stations established by the local sections of the Red Cross at numerous railroad depots. While the obtaining and altering of vessels for hospital ships was arranged between the

Chief of the Medical Bureau of the War Department and the Chief of the Department of Transportation and Communications, their dispatch, general supply, etc., were in the hands of the port commanders of the places from which they sailed. the Chief of the Medical Bureau of the War Department only fixing where they should obtain their medical department supplies. Further information on hospital ships will be found at the proper place on the way from rear to front.

DIVISION ORGANIZATIONS AT HOME.

DIVISION SURGEONS.

In time of peace a medical officer with the rank of colonel fills the position of chief surgeon at each of the 13 divisions. The medical direction of not less than three divisions is then intrusted to a surgeon-general. In the recent war, while it was intended that a colonel should be chief surgeon at each home division, sometimes surgeon-generals of the reserve were apparently so employed, and also, in the absence of higher ranking medical officers, lieutenant-colonels were detailed for this duty in some instances. Decentralization, enforcement of the performance of the duties provided by regulations by the responsible officer, with little interference in details, is the keynote of Japanese army administration generally, and the powers of the division surgeon in relation to the medical department are large in his own field.

In peace times only one routine inspection yearly is contemplated by regulations for chief surgeons of divisions, but in practice this was not strictly adhered to even then, and certainly in war division surgeons at home frequently inspected their own department, sometimes doing this themselves and at others detailing senior medical officers of the division for the work. Conferences were also often held with the medical officers of divisions by their chief surgeons, and in this way the latter were kept thoroughly informed on their own department. Division chief surgeons are empowered to allow division hospitals to purchase medical supplies not on the supply table. In time of peace division chief surgeons are required to have their own person-

nel properly prepared for mobilization. In war, depot sanitary as well as other division organizations are maintained at home, and vacancies at the front are commonly filled from divisions, which are also called on to furnish certain personnel for the lines of communication. Rest stations, established by the Red Cross in a division district, fall under the division chief surgeon. As has already been intimated, division chief surgeons arrange details in regard to the transportation of sick by hospital trains with station commanders; they also order hospital directors in regard to the patients to be transported by such trains. A good part of the medical records in Japan are divisional, the division surgeons compiling many of them and only sending summaries to the Chief of the Medical Bureau of the War Department. Division surgeons at home have two commissioned assistants, one a medical officer with the rank of major and the other a surgeon of the grade of lieutenant; a few noncommissioned officers and privates are also detailed, making a total office force of from 10 to 15.

Under division chief surgeons at home are, first, hospital directors and, second, medical officers of fortresses when such exist in the division district, and surgeons with regiments, squadrons, etc., and those on duty at military schools.

HOSPITAL DIRECTORS AND RESERVE HOSPITALS.

At each division district headquarters in Japan a garrison hospital is maintained in peace. When war comes this is made the principal hospital of the division and all other hospitals and convalescent camps established becomes its branches. This is an excellent plan. The hospital director, an experienced officer of the rank of lieutenant-colonel, is well qualified, by ability and training, for important administrative work and is fully competent to manage the principal hospital and to superintend the work of assistant directors, one of whom is in charge of each branch and of each convalescent camp. Thus a hospital director runs the whole division hospital establishment through his own office, regulating the distribution of patients, procuring supplies by local purchase, providing for their examination, analyses, etc. As the administrative work of his office is large, three or four medical officers are always employed as assistants. In case

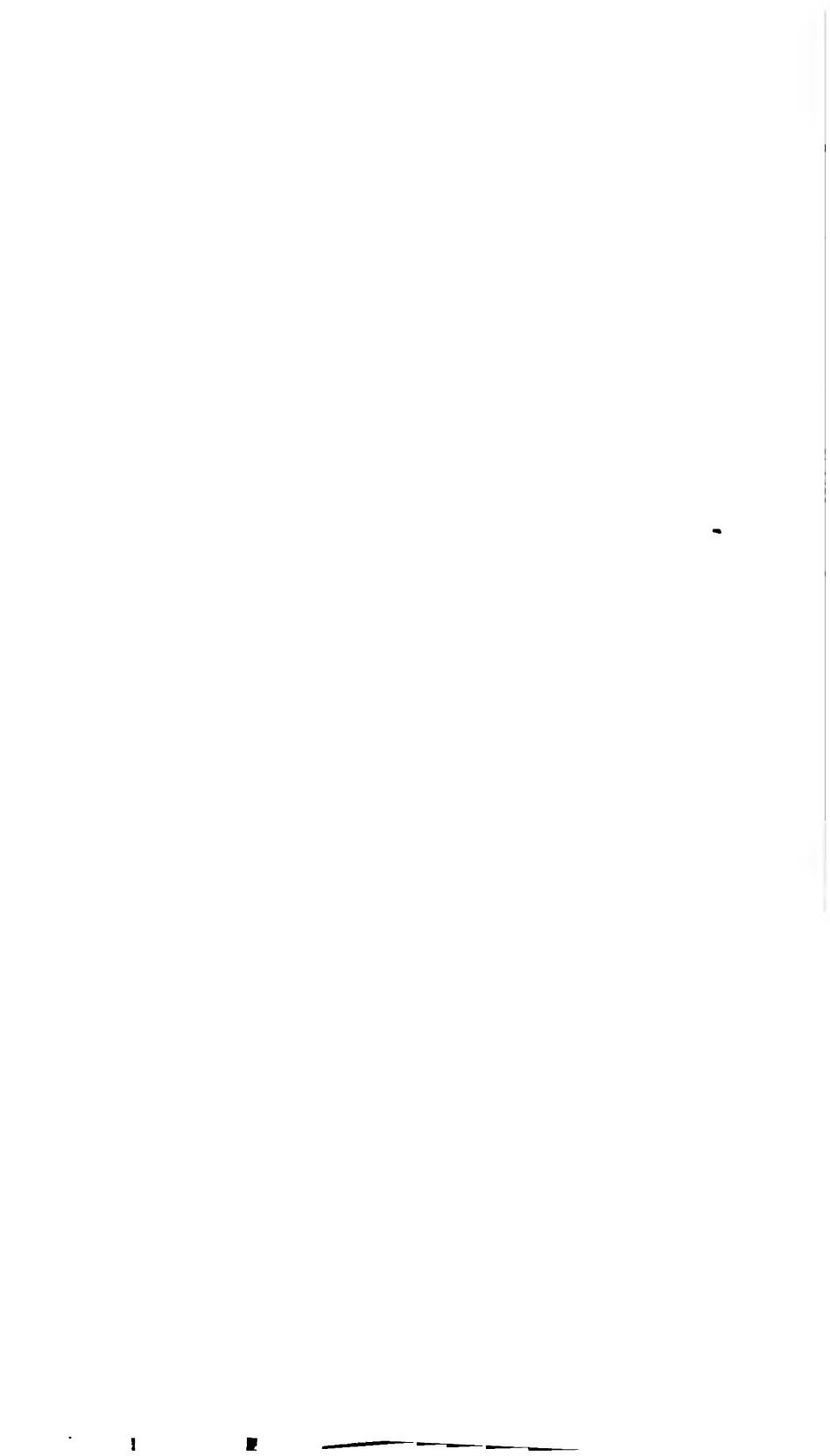
the division surgeon is absent the hospital director fills his place. Each principal hospital has one or more officers of the intendance department, who make purchases and hire transportation as ordered by the hospital director. It is not customary to station an officer of the intendance department at the branch hospitals, but they have always noncommissioned officers of that department at least who make certain purchases, hire transportation, and receive and inspect goods delivered. In time of war no maximum price is fixed for the patient's ration. Apothecary officers perform their own proper duties at all reserve hospitals. The nursing force of the hospitals in Japan comes almost entirely from civilians employed and from the Red Cross, only a few soldiers of the medical department being employed for administrative work under the surgeons.

No officers nor men other than those belonging to the medical and intendance departments were on duty at the reserve hospitals in Japan. When guards were necessary they came by authority of the division commander from a near-by regiment, or gendarmes were furnished. The guard did not report to the director of the hospital, but was supposed to communicate to him any occurrence of interest to him in his official position. The method by which temporary hospital buildings are obtained in Japan in the event of war has already been referred to—buildings were furnished in a sufficient number for the accommodation of all patients. The exact bed capacity of the "Yobi" hospitals in Japan was not obtainable, but it is known to have been something near 70,000. Too much can not be said in praise of the judgment which the Japanese showed in arranging for these hospitals in time of peace. Of course the great advantage of the Japanese system is that, in their hospitals, just as elsewhere, in time of peace they were ready for war.

The allowance of personnel at the Japanese home hospitals was based on the same figures as those for the relief detachments of the Red Cross, which originally obtained them from the army. The allowance for these detachments is, however, that considered necessary for the actual care of sick and wounded, so that, to obtain the number provided for a hospital, the administrative staff, the bacteriologists, chemists, surgeons, laborers, etc., must be added. Moreover, in



16. ADMINISTRATION BUILDING, SHIBUYA BRANCH HOSPITAL, TOKYO (PERMANENT RED CROSS HOSPITAL).





17. TOMAYA BRANCH HOSPITAL, TOKYO.





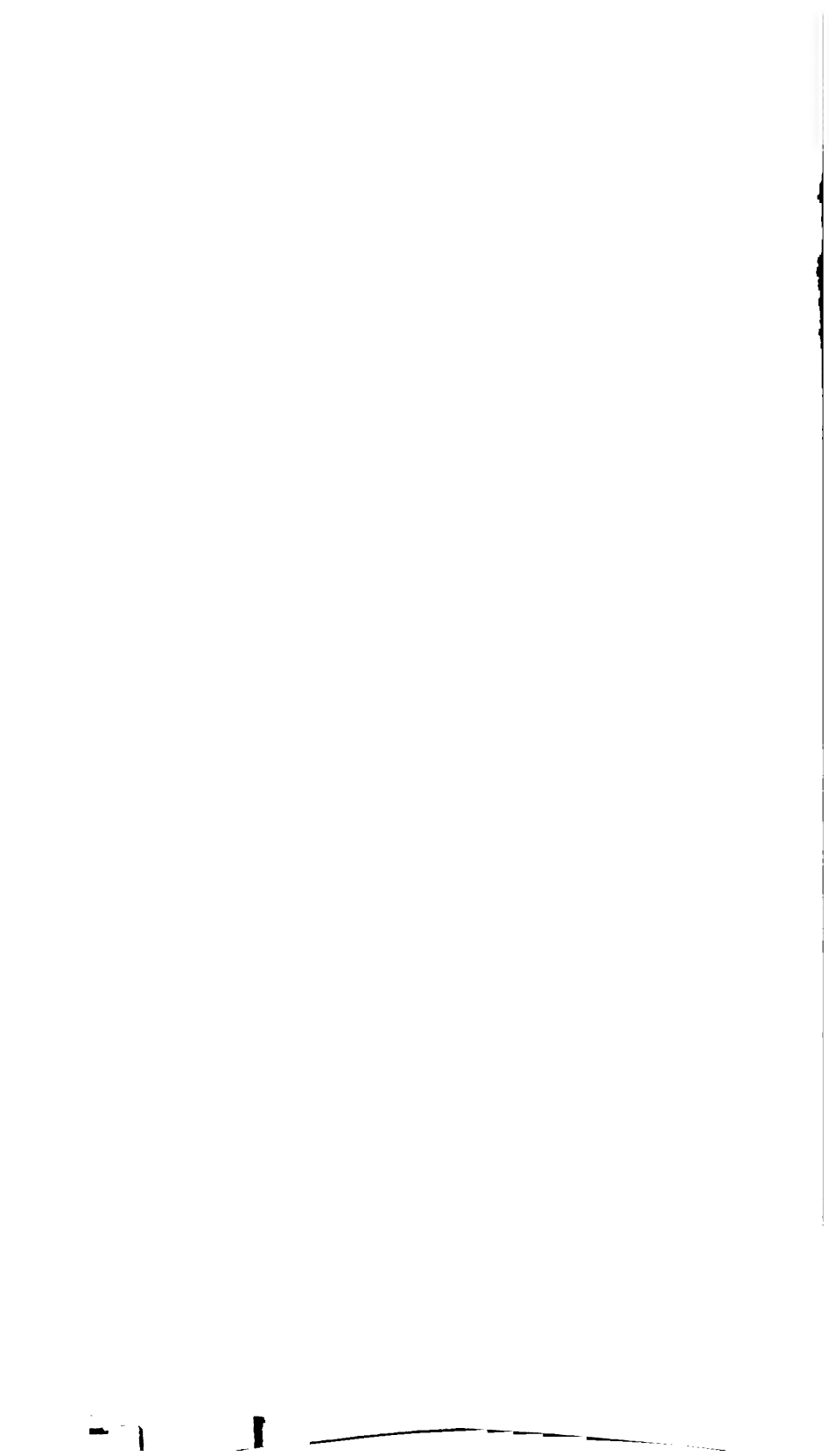
18. WARD ARRANGEMENT, BRANCH HOSPITAL NO. 7, HIROSHIMA.



19. INTERIOR OF A WARD IN A BRANCH HOSPITAL, HIROSHIMA.



20. DISPENSARY, TOMAYA BRANCH HOSPITAL, TOKYO.





21. RECREATION ROOM OF A BRANCH HOSPITAL, HIROSHIMA.



18. WARD ARRANGEMENT, BRANCH HOSPITAL NO. 7, HIROSHIMA.



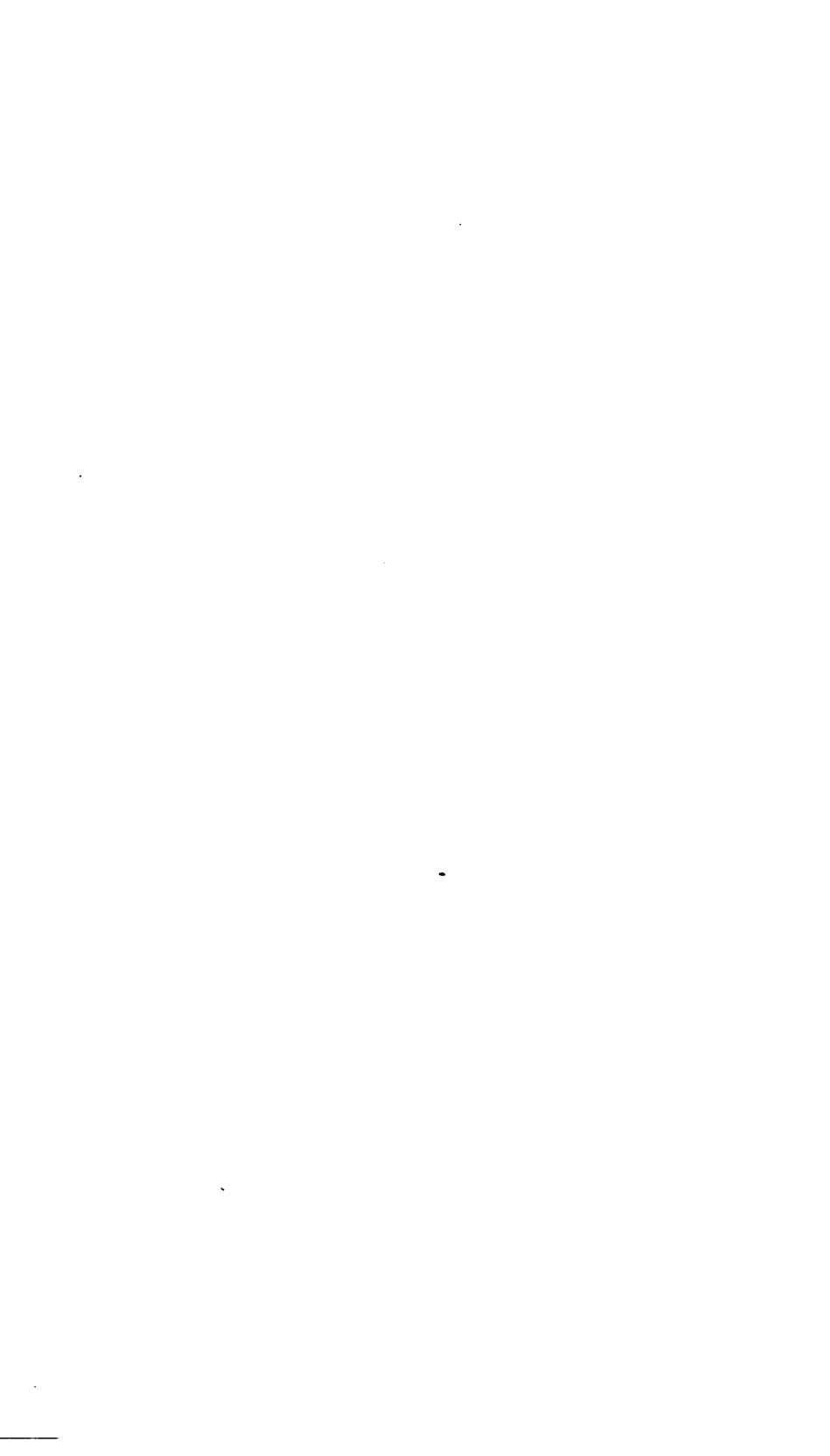
19. INTERIOR OF A WARD IN A BRANCH HOSPITAL, HIROSHIMA.



20. DISPENSARY, TOMAYA BRANCH HOSPITAL, TOKYO.



21. RECREATION ROOM OF A BRANCH HOSPITAL, HIROSHIMA.





22. HOSPITAL WARD AND RICKSHAWS FOR PATIENTS, HIROSHIMA.



23. KITCHEN AT A BRANCH HOSPITAL, HIROSHIMA.

practice the personnel of the Japanese home hospitals was increased to that for their maximum number of patients and, when these decreased, was very gradually diminished, so that for the greater part of the war it was larger than the regulation allowance for the number of patients actually present. Tables covering allowance of personnel may be found in detail for several of the Hiroshima hospitals; as will be seen, the allowance was a liberal one. These home hospitals were well administered, and their patients had good attendance and supplies.

Each of the home hospitals had its convalescent camps, which are estimated to have afforded accommodation for 10,000 patients. At the convalescent camps the Japanese authorities did not attempt to construct hospital buildings. They selected a health resort as the site for the camp, and hired hotels and boarding houses, in which officers and soldiers were treated as guests, an army medical personnel being furnished for the administration and to attend the patients. In addition to this personnel a small guard of gendarmes was habitually provided. Apparently there was little difficulty, however, in dealing with infractions of discipline, the surgeons in charge of the camps saying that it was only necessary for the patients to know that they would be sent away from them in order to prevent misdemeanors. Patients at the camps were sick and wounded who, while no longer requiring hospital treatment, were not strong enough to return to duty. The liberality of the Japanese Government was certainly manifested in these convalescent camps, which showed a wealth of care and good organization which has not been surpassed by any nation. It is not the intention of the Japanese authorities to send home men who are in fit condition for ultimate return to the ranks, but certain sick and wounded soldiers, who are likely to be ill for a long time, may be ordered or permitted to go home, and arrangements are made for their treatment there.

In addition to the "Yobi" hospital organizations, at certain points, such as Moji and Ujina, under division hospitals, receiving hospitals for the temporary shelter of patients arriving were operated at the docks. The sick and wounded of practically all but two divisions were landed at Ujina during the whole war, most of the other patients going to

Moji, but the former port was used more and more as the war went on, as the strong current in Shimonoseki Straits at Moji made it a dangerous harbor. On arrival of patients at Ujina, they had to be transshipped to sampans, which took them to a boat moored at the wharf, to which an inclined plane led; inclined planes also led to railroad cars. Some patients were, however, taken directly by sampans to the hospitals in Hiroshima, some of which were on estuaries. It was intended that contagious diseases be disposed of in this way, but in the latter part of the war, at all events, certain contagious diseases were cared for in the military quarantine station at Niroshima. A large number of sampans were devoted to the exclusive use of the medical department at Ujina; they were under the jurisdiction of the port commander. Each had the green strake.

As elsewhere in the Japanese service, great care was taken by the division hospitals that patients should never be without medical and nursing attendance, and all sick and wounded arriving at ports from ships were met by receiving parties, and those leaving the division hospitals were accompanied by some of the hospital personnel. At Ujina medical officers from the receiving hospital boarded each ship and divided the patients into two classes—first, those to stay at the hospital of the division, and, second, those who were in fit physical condition to be transported to their own divisions; the former class was sent immediately to the proper hospital, and the latter was either at once put on waiting trains or was temporarily sheltered in the receiving hospital until such trains could be gotten ready. On arrival of patients at their home divisions, they were again taken in charge by a receiving party, due notice by telegraph having been given the hospital at which they arrived.

Medical department storehouses were not operated, either at Ujina or Moji, medical supplies en route to the front at both ports, as stated, being in the hands of the department of communications and transportation.

Sufficient data in regard to the medical service at fortresses may be found in the Field Service Regulations of the Medical Department. In the second class, under division chief surgeons, is also the medical personnel with regiments, squadrons, etc., and that with schools. The service of the



24. PUSH CARS BY WHICH PATIENTS WERE CARRIED OVER MOUNTAINS TO CONVALESCENT CAMP AT ATAMI.



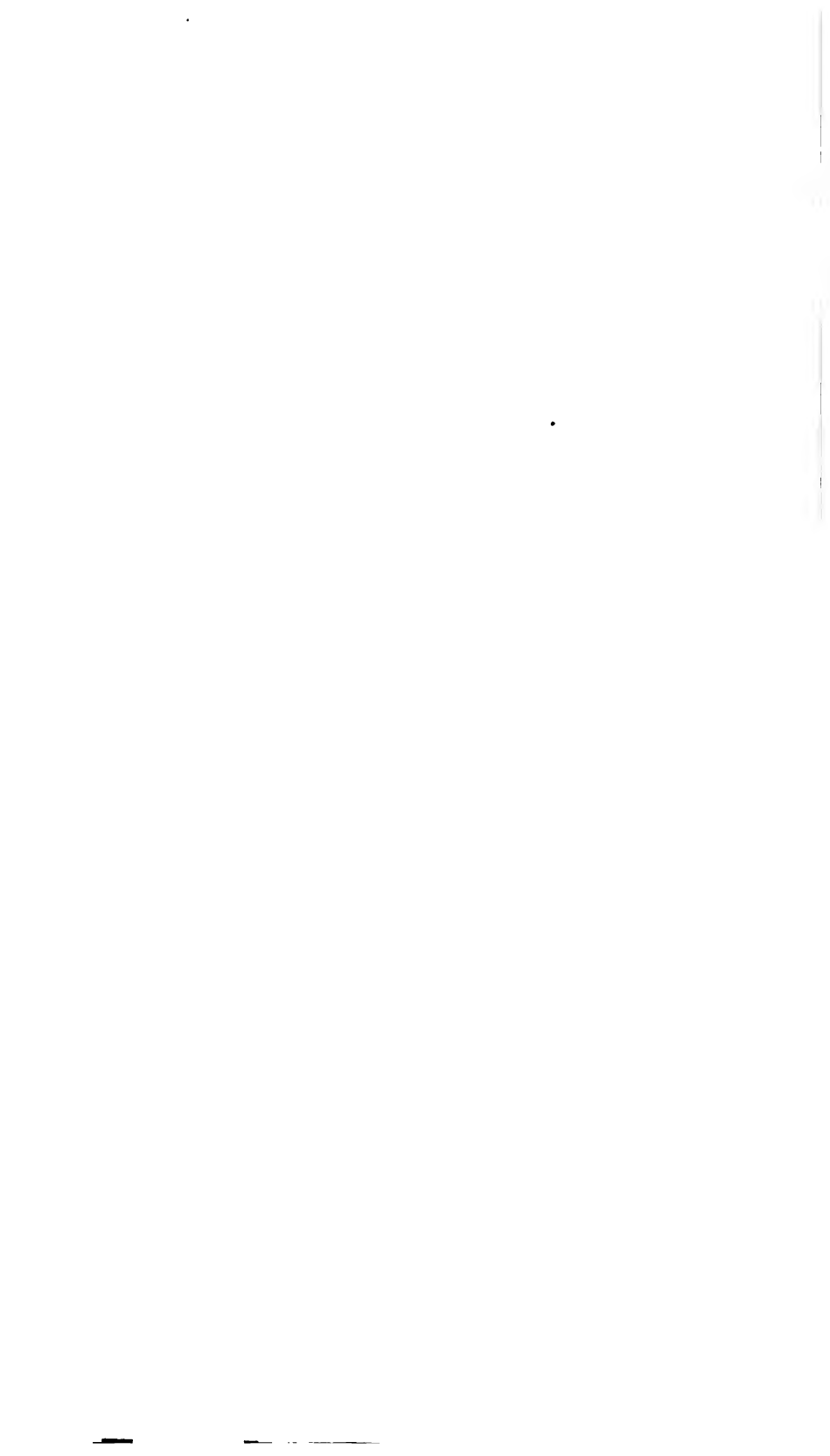


25. CONVALESCENT CAMP, ATAMI.





26. INTERIOR VIEW OF A HOSPITAL CAR.



latter is under the same rules as in regimental service. Regimental medical service will be somewhat more fully described in the field, but it is well to note here that no regimental hospitals are conducted either in peace or war. Regimental and battalion surgeons are empowered to excuse men from drill, to allow them to remain in the convalescent room of the regiment, etc., but they send all cases which will be sick more than twenty-four hours to a hospital.

HOSPITAL SHIPS.

Leaving Japan, the link in the chain between that country and the field of operations abroad was formed by the hospital ships. Eighteen such ships belonging to the army, and two, the property of the Red Cross Association, were in commission during the war. The allowance of personnel on the hospital ships was a liberal one. Women nurses of the Red Cross were largely employed. On the *Rohilla Maru* 55 such women were all lodged in one compartment. The method of running hospital ships, which is similar to that for transports, worked well in Japan. The medical personnel are simply passengers, the headquarters of the department of communications and transportation, at the port of embarkation, holding the same position toward the sailing masters as the agents of their own companies do in peace. Hospital ships carried no cargo nor supplies of any kind except their own. The reason for this was that the authorities did not desire them to be delayed further than was necessary to load patients, which was sometimes done in two hours at Dalny. It was anticipated that some of the lighter draft hospital ships would go up the river and bring patients from Ying-kou, but this did not prove practicable, partly on account of the floating mines there, and toward the end of the conflict even patients at that point were sent to Dalny for embarkation to Japan. At Dalny patients were embarked directly from the docks to the ships. The Japanese have stated officially that during the war 329,000 patients were brought back to Japan. The majority of these came by hospital ships. Some light cases, however, were assigned to transports. Six such transports are said to have been employed on this duty. Each accommodated from 1,000 to 2,000 patients and carried

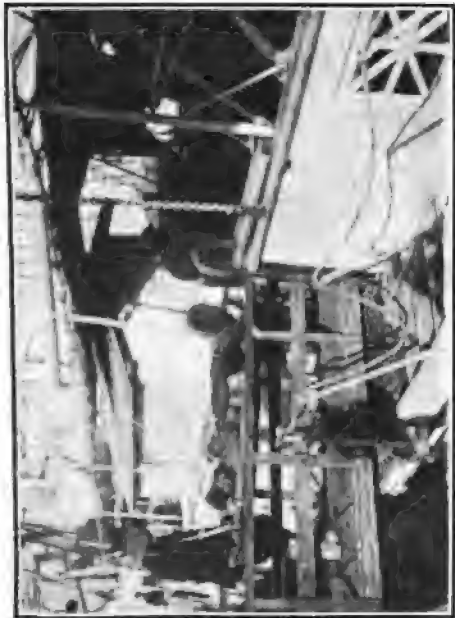
a liberal allowance of medical personnel and supplies. Medical officers were not assigned to transports which did not carry patients, but some supplies were found on them. These were used when necessary by medical personnel en route from Manchuria.

**MEDICAL DEPARTMENT ORGANIZATION IN MANCHURIA—CHIEF
SURGEON IN LIAO TUNG GARRISON.**

As has been stated, this garrison constituted the general lines of communication in Manchuria, its commander being under Imperial Headquarters. The chief surgeon, an officer with the rank of colonel, had practically the same powers as a division surgeon at home. In February, 1905, when, it will be remembered, the garrison comprised territory covering Port Arthur on the south to Liao Yang on the north, the chief surgeon, who was stationed at Dalny, had under his jurisdiction, besides the regimental surgeons of troops therein, large hospitals at Port Arthur, Dalny, Haicheng, Tashih-chiao, and Yinkou.

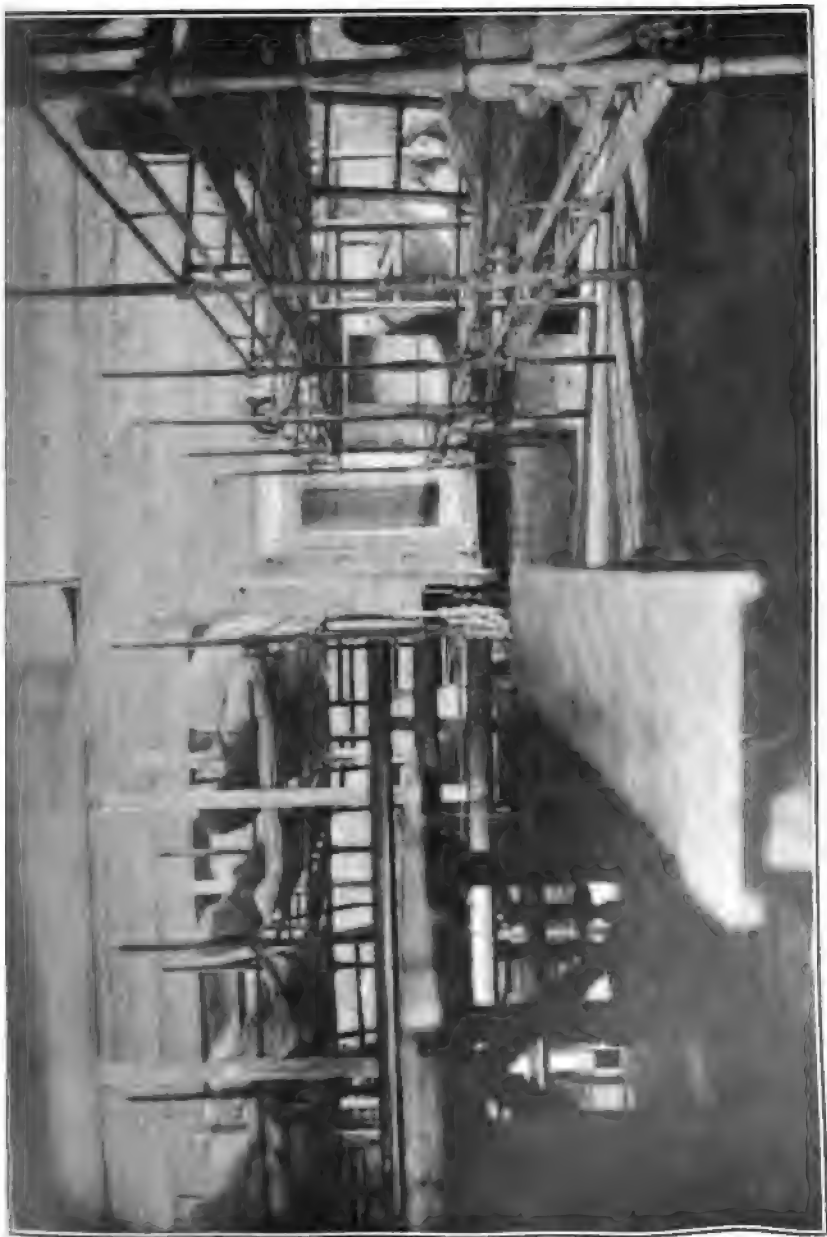
The hospitals at the first-named place naturally differed somewhat from those at the others, as the former were mainly devoted to the care of sick and wounded prisoners of war, while the latter were regulation line of communication hospitals. Port Arthur at the time of its surrender contained about 18,000 Russian patients. These were evacuated to Japan through Dalny as rapidly as possible, but a month after this fortress fell, the majority of the severe cases of illness and injury in the Russian garrison still remained there, and a number of Japanese were also found in its hospitals. After the occupation of Port Arthur the Japanese permitted the Russian surgeons to care for their own as far as possible, leaving them in charge of their hospitals, subject to inspection by Japanese medical officers detailed for this duty. Some of the Russian hospitals in Port Arthur were notably good, that of the navy being especially so.

The administration duties in connection with the care and evacuation of Russian patients at Port Arthur were enormous. In February, 1905, though the chief surgeon of the Liao Tung garrison still had his office in Dalny, where his



27. LOADING JAPANESE WOUNDED ON HOSPITAL SHIP AT DALNY.





29. BUNKS FOR PATIENTS, KOSAI MARU.



30. SEVERELY WOUNDED PATIENTS IN SAMPAN EN ROUTE FROM A HOSPITAL SHIP TO THE SHORE, UJINA

assistants comprised three medical officers and about twelve subordinates, he spent the greater part of his time in Port Arthur, where a medical officer with the rank of major was in general charge of the Russian patients. This officer occupied much the same administrative position as do hospital directors in Japan, with all assistant directors under him, but had much more difficult problems to solve on account of the Russian sick and wounded, whom he was compelled to supply, concentrate, and evacuate. To accomplish this he established a large administrative office in the old town, with about 30 clerks.

It is almost impossible to make even an estimate of the personnel which the Japanese had at Port Arthur in February, 1905, nor could the number of their patients be ascertained. The number of sanitary personnel to patients is thought to have been from one-fourth to one-third that allowed by regulations for the Japanese home hospitals.

The hospitals at Port Arthur all had guards detailed from line troops. These, so far as observed, had no connection with the hospital directors further than that they reported anything to the latter which they considered of interest to them in their official capacity. It should be noted here that none of the other hospitals in Manchuria, whether on the lines of communication or at the front, had a special guard detailed to them, though gendarmes on their rounds gave attention to hospitals as well as to other organizations in matters pertaining to provost duty.

The administration of hospitals on the lines of communication is based on the same system as that followed at the home hospitals—that is, a principal hospital is created in each place, and all other hospitals established there, or even in nearby towns in some instances, are made branches, the director of the principal hospital being thus made responsible for all hospitals. The Japanese did not attempt to erect many buildings for hospitals in Manchuria. To have done so generally would have been impracticable, so, with few exceptions only, barracks, Russian buildings, or Chinese houses, were used for hospital purposes. Great care was taken that sick and wounded officers and soldiers should have the best available buildings, which, when necessary, were extensively

repaired and had many additions made to them. While these hospitals did not compare favorably with those in Japan, they afforded good shelter and were invariably well policed and well administered.

In February, 1905, Dalny had a principal hospital with two branches. The principal hospital was in the Russian town, where it occupied the old Russian hospital, the Russian church, and some Russian houses. One branch was in Russian houses in the town and the other in some Russian barracks about 2 miles to the north. Later one of these hospitals was moved to a large building just at the edge of the Chinese town, but before my return in September it had been returned to its original site. Early in the war, some wooden receiving sheds for patients were built at the railroad station. Patients were sent directly to the dock by railway train.

Before the fall of Port Arthur Dalny had occasionally sheltered 20,000 patients, but as some of the buildings which were then used had been diverted to other purposes, in February, 1905, hospital accommodation for only 10,000 was available. About 5,000 patients were under treatment at that time. In September accommodations had been reduced to about 6,000 and 2,800 were actually under treatment. Some Japanese buildings of the temporary hospital type were then seen; these had been erected for contagious diseases. In February, 1905, the Japanese were strained to their utmost in providing adequate personnel for the care of their sick in Liaotung garrison; this was manifest in Dalny. On the whole, however, the medical attendance given patients there even at this time was good, and good food in ample quantities was supplied them. The proportion of medical personnel to patients at the Dalny hospitals in February, 1905, was somewhat less than one-third of the regulation allowance for Japanese home hospitals.

In general, at the line of communication hospitals the allowance of personnel was about one-third of the home regulation. Even this was fairly liberal, especially as evacuation of patients to Japan was rapid, and on account of the easy methods for hire of personnel in vogue in the Japanese army any amount of unskilled labor could be obtained in



31. TRANSPORTATION PROVIDED FOR PATIENTS FROM HOSPITAL TO TRAINS, WINTER, DALNY.



32. WARD, PRINCIPAL HOSPITAL, DALNY.

an emergency, thus allowing the trained personnel to devote their attention to actual care of the sick and to superintendence of hired Chinese coolies. The Dalny hospitals, for example, always had a great many Chinese, who did most of the bearer work, which was heavy, and all rough labor.

The other important Liaotung garrison hospitals in February, 1905—Haicheng, Tashihchiao, and Yingkou—had accommodations for from 2,500 to 3,000 patients. The last named was never inspected by the writer, and the other two only cursorily. None of them presented special features of interest, and the remarks made in reference to Dalny may be held to apply to them all.

With the extension of the limits of the Liaotung garrison north, more and more hospitals fell under the jurisdiction of its chief surgeon. Just when Liaoyang was included is not known, but probably this was immediately before the battle of Mukden; at all events, the principal hospital of the garrison was located there from about that time till the end of the war. The hospitals at Mukden were included under those of the chief surgeon of Liaotung garrison about the 1st of July, and those at Tiehling about September 1. At the end of the war, therefore, the chief surgeon of the garrison, who was then stationed at Liaoyang, had under his jurisdiction large line of communication hospitals at Tiehling, Mukden, Liaoyang, Haicheng, Tashihchiao, Yingkou, and Dalny. Prior to the extension northward of Liaotung garrison, some of these hospitals had belonged to the lines of communication of the separate armies. For example, in May, 1905, the Mukden hospitals were under the chief surgeon of the lines of communication of the Fourth Army, as were also those at Tiehling. When these various hospitals came under the Liaotung garrison, measures were usually taken to fit them more perfectly for hospital purposes, and a great many men were employed and money was freely spent in doing this. The methods for obtaining satisfactory hospitals on the lines of communication have been described under the head of supplies. In September, 1905, Tiehling had accommodation for about 5,000 patients, Mukden for 2,500, Liaoyang for 10,000, Haicheng, Tshihchiao, and Yingkou together for from 2,500 to about 3,000, and Dalny for 6,000, so the general line of communication hospitals could then accommodate about

26,000 patients. All these hospitals had at this time ample personnel, and the patients in them were well cared for and well fed.

In addition to the hospitals in Liaotung garrison, there were a number of storehouses in which the medical department was interested. The Manchurian army storehouse was located at Dalny. A lieutenant-colonel of the line was in command of the entire establishment, and an officer of the medical department, with the rank of major, 5 assistant medical officers, 10 noncommissioned officers, 30 privates, and 4 instrument repairers constituted the force in its medical section. This storehouse had a number of branches, which were increased as necessary as the limits of the garrison were extended to the north. They did not invariably have medical sections, but at the end of the war large ones were found in the branches located at Tiehling, Dalny, and Yingkou, and smaller ones at Mukden, Fusan, and Anshantien. A medical officer was in charge of each medical section, with, in many cases, another surgeon as assistant, and all of them had some instrument repairers. Their other personnel was similar to that given for Dalny. As no issues were made, except in unbroken packages, it was not necessary to station apothecary officers in them. Their personnel, except the medical officers, was largely composed of hired civilians. The contents of these storehouses were, of course, of the utmost value to the army, and great pains were taken to provide good shelter for them. In order to do this, buildings were always erected where they could not be obtained, which was usually the case. For example, the medical section at Dalny had constructed for it five galvanized-iron buildings, with floors made of cement or planking, and some underground structures, which were designed especially for winter use as drugs stored in them would not be so liable to freeze.

While it is obvious, of course, that rail and boat transportation of patients in Manchuria was by no means always confined to the limits of Liaotung garrison, it will, perhaps, be better to discuss this subject here. It was the intention of the Japanese authorities to send all serious cases back to Japan. This meant all cases which would not recover within one month. Beriberi patients were also invariably sent home during a great part of the war, as such wretched re-



33. PART OF MEDICAL SECTION, MANCHURIAN STOREHOUSE, DALNY.

sults were obtained by trying to treat them in Manchuria. All cases which would not promptly recover at the front were forwarded a greater or less distance to the rear. Railroad transportation was, therefore, required for a great many patients. Some general agreement in regard to it was reached between the chief surgeon of Liaotung garrison and the officer in charge of communications and transportation, but special arrangements as to trains were left entirely to station commanders and hospital directors. As has been stated, the Japanese did not use any hospital cars in Manchuria. Except immediately after a great battle, there was no shortage in box cars and trucks, and even soon after Mukden patients who could bear railway transportation were promptly dispatched to the rear on them. Sufficient, though limited, attendance for trains carrying patients was always supplied, usually from line of communication hospitals, and necessary medicines, bed pans, and other articles for their care were not lacking. Due attention was also given to assigning the worst cases to box cars, reserving the open trucks for less seriously ill or injured. The box cars, in which sick and wounded were placed on bed sacks or mattresses, were not bad in summer. In winter the long cold trip, twenty-six hours from Liaoyang to Dalny, was a bitterly hard one during which all patients, whether in the box cars or open trucks, suffered severely. The latter, which were necessarily used for patients, sometimes even during the coldest weather, were about as much as a well man could stand. In order to mitigate the sufferings of patients during the winter, many blankets were furnished them, as were also large charcoal stoves, of the Japanese pocket-stove type. These both came from the medical department. As the Japanese use the narrow gauge for railways, their cars are very much smaller than ours, so that the number of patients which they were able to transport in them is not of great importance to us. However, they put, at the maximum, 12 severe or 25 slight cases in a box car. At one time, immediately after the battle of Mukden, six trains for patients were operated daily south from Liaoyang. Each had two engines and 50 cars, or a capacity sufficient for 1,250 slight cases. At all the railway stations near which hospitals were located receiving sheds were built or tents were erected for

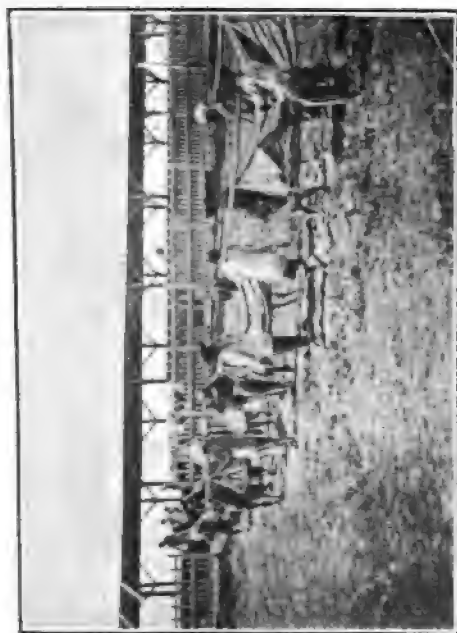
the temporary shelter of patients. By regulations, sick and wounded arriving must be brought to a station one hour before their train starts. Medical officers and attendants were always found at the principal stations, with numerous coolies to load and unload sick and wounded.

The length of time which the Japanese required to bring patients home from the front is of some interest. From the Port Arthur army, through Dalny, fifteen days was about the usual period to Hiroshima; from the Mukden battlefield nearly a month was required. No patients were ever sent directly without stops from either place, and at the end of the war even more time was taken from the north, as it was thought giving sick and wounded short rests on their way was beneficial. From Tehling, for example, patients were always sent to Mukden, then to Liaoyang, and after a shorter or longer stay went on to Dalny and Japan.

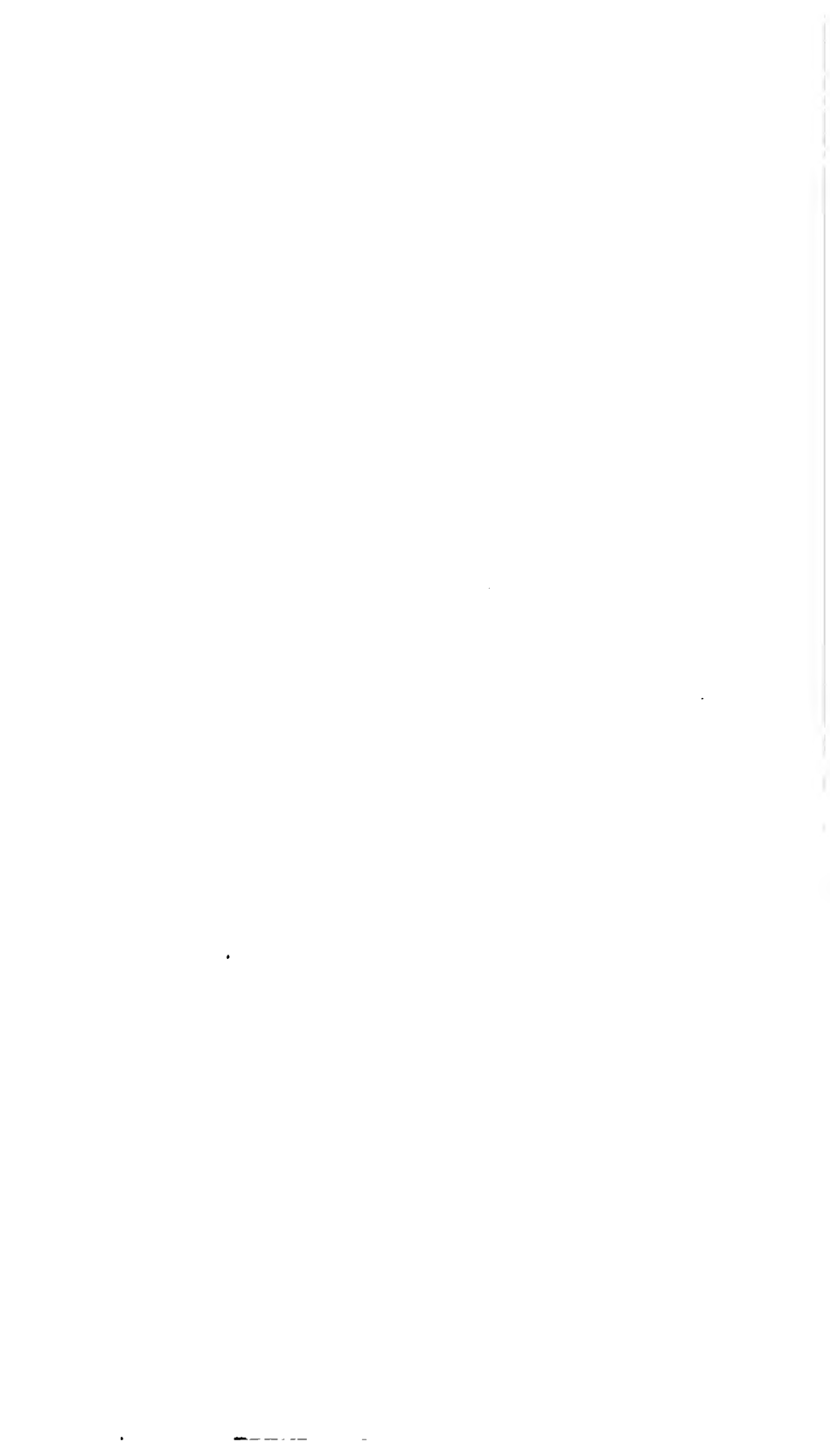
Boat transportation for sick and wounded was not employed in the Second Army in Manchuria. It is understood, however, that considerable use was made of boats to carry patients in the Third Army during the summer of 1905, when the majority of its sick and wounded were sent south by junks on the Liao River.

MANCHURIAN ARMY HEADQUARTERS.

Before passing to the consideration of the next administrative office of the medical department, attention should be called to the fact that the Japanese had no principal medical officer at Manchurian Army Headquarters. At one time there was considerable talk of appointing such an officer. Though nothing ever came of this, it indicated that the authorities recognized that this change in their organization might be a desirable one. To an observer it appeared probable that questions might arise on the separate lines of communication of the different armies where they touched each other which could have been settled better and quicker in the field; for example, when it was necessary that a line of communication hospital be established in front of the general lines of communication, this would pertain to the lines of communication of one army, though it might receive patients from all of them, and prompt decision, with an exact local knowledge of



34. TRANSPORTING PATIENTS TO KAIYUEN BY CHINESE BEARERS.

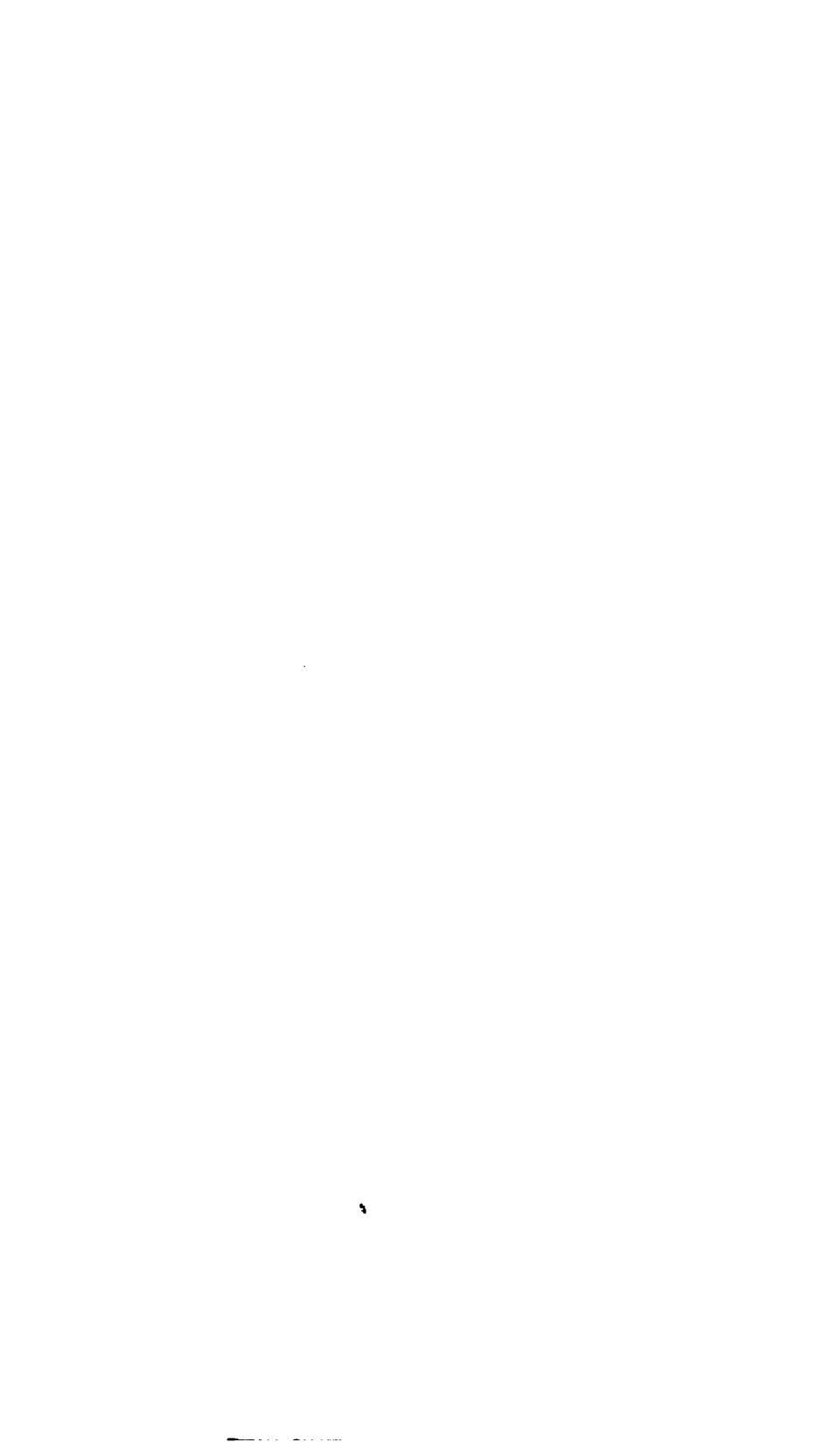




35. LOADING PATIENTS ON CARS AT MUKDEN STATION.



36. PATIENTS FROM THE NORTH ENTERING DALNY ON OPEN CARS IN THE WINTER.



the different armies, must have been desirable in order that a determination could be reached as to which separate line of communication should establish the hospital required. In the absence of a principal medical officer in the field, this and similar questions were necessarily referred to Tokyo. Though no apparent delay or confusion resulted, it is quite probable that the administrative method pursued did not prove entirely satisfactory in this respect.

ARMY CHIEF SURGEON.

Each army had its own chief surgeon, who had the rank of major-general, one of the three major-generals on the staff of the army commander, the other two being the chief of staff and the chief of artillery. By regulations, an army chief surgeon is given the right to know every order issued by the army commander, so that he may take proper measures in reference to his own department. Arrangements in reference to extra transportation, hospital accommodation, etc., are made with the chief of staff by the army chief surgeon. The general medical direction of line of communication chief surgeons is also vested in the latter. Division chief surgeons and those of independent brigades, etc., are subordinate to the army chief surgeon, though he does not interfere in the internal medical administration of those units, his duties being principally confined to coordinating the service between the lines of communication and the divisions and between the different divisions. Except in cases of emergency, division and line of communication chief surgeons address each other through him. When the army chief surgeon finds it necessary to use a field hospital on the lines of communication he obtains the order of the army commander. It was thought that the requests of the army chief surgeon to the army commander and the orders issued by both on medical matters during some great battle of the war would be of considerable interest. These were obtainable for Nanshan only, and what was received was of trivial importance, only referring to the taking care of patients of one division by the medical department organizations of other divisions. However, it is not thought probable that any other instructions were issued, either by or at the request of the army chief sur-

geon, during this battle, the internal medical administration of the divisions being left entirely to their own chief surgeon. Unfortunately, there was no army line of communication service worthy of consideration at Nanshan. Army chief surgeons make occasional inspection of their entire medical departments, but they do not go into minutiae as do the division surgeons. After the army had taken the line north of Tiehling, which it held to the end of the war, the chief surgeon of the Second Army immediately made a careful inspection from the front back to the railway, thus informing himself on points connected with transportation of patients, their supply, location of hospitals, etc. An army chief surgeon has 2 medical officers as assistants, one ranking as captain and the other as lieutenant, and an office force of 3 chief nurses and from 5 to 10 detailed soldiers.

CHIEF SURGEONS OF THE LINES OF COMMUNICATION OF THE SEPARATE ARMIES.

In the Japanese service the lines of communication of each army has its chief surgeon, an officer with the rank of colonel. This officer, under the commander, superintends the medical service on the lines of communication. The chief surgeon of the lines of communication of an army is required to be in direct communication with division surgeons, in order that he may properly execute his duties. He is also required to give special attention to the transportation of patients to the rear, making careful plans for this. According to the field-service regulations, a chief surgeon on the lines of communication receives the directions of his army chief surgeon in regard to the medical service, but in respect to transportation of wounded and the employment of the Red Cross is directed by the Inspector-General of Field Sanitation. As a matter of fact, in Manchuria the services of Red Cross personnel were pretty well confined to the general lines of communication. In the few instances that lack of other medical personnel required that they should be sent forward to the separate lines of communication of an army they came with other personnel, and, as soon as possible, subsequently were replaced and returned. Special arrangements



37. LIAO TUNG GARRISON HOSPITAL, MUKDEN STATION (PREVIOUSLY A RUSSIAN RED CROSS HOSPITAL).



38. INTERIOR VIEW, LIAO TUNG GARRISON HOSPITAL, MUKDEN STATION.

for their employment were therefore hardly necessary. If any directions in reference to the transportation of patients were given separate line of communication chief surgeons by the Inspector-General of Field Sanitation, they were of the most general character. The latter officer, however, necessarily indicated the destination of patients returning to the rear, and it was in this particular and in directing the establishment of advanced line of communication hospitals that he supervised and directed the service of army line of communication chief surgeons.

When the Inspector-General of Field Sanitation determined that a line of communication hospital for an army must be established the greater part of the personnel for it was sent from the general lines of communication (Liaotung garrison), though the Sanitary-Reserve Personnel and the transport department for patients were also employed. Though the regulations empower a chief surgeon of the lines of communication of an army to establish a line of communication hospital, they rather apply to an army operating independently. What is done when several armies are together has already been made clear. These hospitals were, of course, under the chief surgeon of the lines of communication of an army. They varied in size and number according to special needs and replaced field hospitals, or, in some instances, stationary hospitals. While it was not intended that such hospitals should be made as complete in every detail as were the general lines of communication hospitals which finally replaced them, a considerable number of laborers were frequently employed for them, and a good many repairs to buildings, etc., were made in them. Liaoyang Hospital, with its branch at Yentai, was of this character during the greater part of the winter of 1904 and 1905. Yentai later became a rest station and Liaoyang passed under the jurisdiction of the chief surgeon of Liaotung garrison, just as Mukden and Tiehling did finally. Before the battle of Mukden a line of communication hospital had been established for the Second Army at Langtungkou, which may be seen on the map of that battle, and as early as March 22 another such hospital was located near Suchiatun

Station. This may be also seen on the same map. In a great battle, such as Mukden, the stationary hospitals were of course, insufficient to take all patients from the field hospitals, which were necessarily cleared for a possible advance. The two line of communication hospitals just mentioned therefore proved of great value. The personnel for Suchiatun Station was well forward in the lines of communication, coming in great part from Yentai and Liaoyang, and was sent up, as soon as called for, by the line of communication chief surgeon of the army. Liaoyang and Yentai were cleared of patients before the battle as far as possible, and their personnel was greatly augmented in strength.

Under the chief surgeon of the lines of communication of an army are certain medical department organizations, which are mobilized for each division, though they remain in the lines of communication. Some of them have already been mentioned; they are the Sanitary Reserve Personnel, the transport department for patients, and the division medical supply depot. In addition, in practice, though not provided by regulations, each army had its own medical supply depot, under the chief surgeon of the lines of communication.

It will perhaps be more convenient to discuss first the medical supply depots of the lines of communication of an army. In the Second Army, at least, in the fall of 1905 an army medical depot was located on the railroad at Tiehling. Supplies were received here from the Manchurian storehouse and were then sent to the division depots by carts. It was intended that this haul should not be over 20 miles, and the division depots were located at places so that the distances were cut down to this. While each division had its own depot, it was not always necessary to operate all of them. This point was determined by the army chief surgeon and the line of communication chief surgeon. At the end of the war all division medical depots belonging to the Second Army were in operation. This was necessary on account of the long line the army occupied. From division depots supplies went principally to field hospitals and sanitary companies, but sometimes also directly to troops. Before a battle the Japanese depended more on giving the field hospitals and sanitary companies ample



30. ARMY MEDICAL SUPPLY DEPOT, TIEHLING.



40. DIVISION MEDICAL SUPPLY DEPOT, MUKDEN STATION.

supplies, with extra necessary transportation, rather than on attempting to supply them from the division depots during the action. At least this was the case at the battle of Mukden, during which only a small amount of medical supplies came from the depots while the fighting was going on, the field hospitals and sanitary companies being heavily loaded with supplies just before it, and immediately on its conclusion depots being available to replenish stores used.

The Sanitary Reserve Personnel was always kept well up toward the front in the lines of communication. In battle this organization, which is capable of division into three parts, establishes the stationary hospitals, which either receive patients from field hospitals or replace them. This was arranged between the army chief surgeons and chief surgeons of the lines of communication, or between the latter officers and division chief surgeons. Authority of line of communication commanders is required for the establishment of these hospitals. As it was anticipated that patients might be neglected at the time of the transfer from field to stationary hospitals, when possible the line of communication chief surgeon or his representative superintended the transfer. At the time of halt between battles, stationary hospitals were maintained at certain points on the lines of communication if this was thought necessary by the army and line of communication chief surgeons. They then really constituted station hospitals. In other cases the Sanitary Reserve Personnel was assigned for duty to line of communication hospitals of its own army or was sometimes split up to man rest stations.

The transport department for patients was also kept at the head of the lines of communication. During battle this department was worked to the front as rapidly as possible, so that patients might be removed by it from field hospitals to stationary or line of communication hospitals. It has three medical officers and is capable of division into three parts for the establishment of rest stations, which were located at points enroute where they were needed because of the long distance between field and stationary hospitals, etc. Army or line of communication chief surgeon and not division chief surgeons regulated such services. If all pa-

tients can not be transported by the transport department for patients, the chief surgeon of the lines of communication may call upon the commanders of the lines of communication posts, so that he may obtain the extra transport required.

Besides the organizations just described as under chief surgeons of the lines of communication, in the Second Army, at least, one other very important one was found. This was a field laboratory, which, during the summer of 1905, was located at the head of the lines of communication, at a little Chinese village named Chingungpu. This was an excellent institution, designed for making all chemical and bacteriological examinations of too complicated a nature for the field hospitals. Some medicines were also prepared here from crude drugs, which were purchased locally. A good galvanized-iron and mat building was erected for the laboratory, whose personnel, while it varied somewhat in strength, consisted usually of one medical, two apothecary officers, and half a dozen subordinates.

Sometimes immobilized field hospitals necessarily remained within the territory of the lines of communication of the army. As these were divisional or brigade organizations, chief surgeons of the lines of communication were not empowered to issue orders to them directly.

Chief surgeons of the lines of communication of separate armies have two or three assistants, one of whom ranks as a major, three chief nurses and about seven soldiers as an office force. The duties of the senior assistant are important, as, besides office work, he usually superintends the replacement of field by stationary hospitals, and acts as medical and sanitary inspector of all medical organizations and troops within the lines of communication.

DIVISION SURGEONS IN THE FIELD.

Each division at the front had its own chief surgeon, an officer with the rank of colonel. The division surgeon, under his commander, superintends the medical service of the division, receiving instructions from his army chief surgeon in regard to medical matters. Division surgeons are given the right to know all the orders of their commanders, just as are army chief surgeons. As stated, they are in close communication with chief surgeons of the lines of communication. Under the division surgeon were the field hospitals,



41. STATIONARY HOSPITAL AT HSIAOYUSHUPU, BATTLE OF MUKDEN.



42. TRANSPORT DEPARTMENT FOR PATIENTS, BATTLE OF MUKDEN.



43. FIELD LABORATORY, LINE OF COMMUNICATION, SECOND ARMY, CHINGUNGPU.



a sanitary company, and the medical personnel of the regiments, batteries, etc. According to the Japanese service regulations, six field hospitals were to be mobilized for each division. Sufficient personnel for this number was not obtainable, however, so that four was the number fixed upon. Some of the divisions had more than this, the Fifth, for example, having five. One of these was given to another division. The Eighth, at the battle of Mukden, had but three. The sanitary companies were found insufficient in strength for the performance of their special duties, and in the Second Army, at least, were augmented in personnel by the detail of additional bearers from the train.

Division organizations in halt.—At times of halt between battles division surgeons, who were invariably quartered close to their commanders, occupied themselves principally with inspections, both of sanitary conditions and of their subordinate personnel, the greater part of the routine work of their offices being left to their assistants. Another of their important duties at this time was the establishment of quartering hospitals, for which the order of division commanders was necessary. Regimental, battalion, and other senior surgeons with units were informed of the location of these hospitals, and were directed to send their patients to certain ones designated.

In halt, regimental surgeons and battalion surgeons (the battalion was, in this respect, really the Japanese unit in the field) and those of other troop organizations lived in close contact with the men, whom they constantly instructed on sanitary matters, both by informal talks and by set lectures. Such surgeons also were directly responsible for the sanitation of their organizations and for that of the inhabitants in the villages which their units occupied. No regimental hospitals were established, but a battalion dispensary was located in a room in one of the group of buildings taken by its organization, to which all patients were conducted at a fixed hour each day by a noncommissioned officer. The surgeon prescribed for them there and returned them to duty, excused them wholly or partially from duty, but sent all serious cases to a hospital designated by the division surgeon, or, in case of emergency, to the nearest hospital. Company bearers or other soldiers were frequently employed, on

the request of battalion surgeons, to carry sick men to near-by hospitals. The equipment of the battalion dispensary consisted of its chests and litters.

The sanitary companies at time of halt were quartered in villages, with their own transportation, just as were other troop organizations. Sanitary companies were regarded like other companies in that their work was supposed to be done in battle. They were not employed in the service of immobilized field hospitals. Sometimes in halt, when conditions were such that many patients would require transportation for considerable distances, a part or the whole of the sanitary company was stationed at a convenient place and employed to bring sick and wounded back to immobilized field hospitals. In halt, some instruction was given sanitary companies, but, as has been already stated, it is not thought that the Japanese utilized the time between battles to the best advantage for the further teaching of their personnel. During the course of the war it would certainly have been possible to give them better knowledge than they possessed of the application of dressings, etc., and thus to make them much more efficient on the field of battle, where the number of casualties absolutely precluded personal attention by medical officers to a large percentage of the wounded. All the supplies of the company remained with it. The transportation of this organization is an integral part of the company to which it belongs, being mobilized with it. Sometimes, in halt, all such transportation remained with its own sanitary company, being used to supply it, but more commonly part of it was temporarily taken for the general transport of the army, always, however, being returned to the company if a battle was imminent. Train soldiers, of whom the Japanese have one to each pack animal, invariably accompanied their animals. Some sanitary company soldiers were occasionally also used temporarily to guard stores, for which duty they were armed with revolvers.

The nearest hospitals to the front at time of halt were the quartering hospitals (Sheibyoin), each of which, in practice, was organized by immobilizing the whole or part of a field hospital. Of course many, if not all, of the field hospitals would be crowded with wounded immediately after a battle;



44. SHEIBYOIN OF A KOBİ BRIGADE, CHINGUNGPU.



45. STAFF IN WARD, SHEBYOIN, FIFTH DIVISION, NEAR MUKDEN.



45. OPERATING ROOM AT A SHEIBYOIN OF A KOBİ BRIGADE.

at least this was the case at the battle of Mukden. No special orders were issued immobilizing such field hospitals, which went on with their work until their patients had been evacuated to the rear or they were relieved by other hospitals. After this, however, the field hospitals which had been most busily engaged were sent to villages for rest, and others, or sections of them, were selected for immobilization by division surgeons as Sheibyoin, and were so made by order of the division commanders. (The medical personnel of the division, other than that of field hospitals, may be employed at Sheibyoin, though in practice it was not frequently so utilized.) The Sheibyoin then worked on under their new designation, receiving all patients from certain districts at the front. The number of Sheibyoin needed was determined upon by division surgeons. This depended largely on the distance from the front to stationary and line of communication hospitals or to rest stations. After the battle of Mukden, when the Second Army had taken the line north of Changtufu, Sheibyoin were open near the front and at distances of about 10 miles apart back till one came within about the same distance of a stationary hospital, a line of communication hospital, or a rest station. Each Sheibyoin had a contagious disease section, where the greatest pains were taken to isolate all epidemic cases. All these hospitals did a good deal of careful scientific work in differentiating disease, and their laboratories were, as a rule, well equipped. Patients in them were well cared for and well fed. Prices for all articles for sale were fixed by the military administrators, but the hospitals were not limited in their daily expenditure for the rations of patients. It was often necessary for the intendants officers to go long distances to procure food, even down to Yingkou sometimes. Slight cases were never sent farther to the rear than these Sheibyoin, being returned from them to their regiments. These hospitals were important, as they saved many soldiers to their divisions, who, without them, would have gone to the rear, and whose services might therefore have been lost for many days. Patients not likely to recover within a short time were forwarded from Sheibyoin to the rear, as were all cases of beriberi. If the rear hospital designated to receive such patients

was crowded, it notified the Sheibyoin; otherwise patients went to the rear as judged necessary by the commander of the Sheibyoin. The medical attendance required during transport came from the latter.

The supplies of a Sheibyoin consisted of the regulation supplies of the field hospital which was immobilized to form it, including usually the extra supplies of the latter, which came from the lines of communication on request of the division surgeon. The transport of field hospitals pertains permanently to such organizations, just as does that of sanitary companies, and in practice that of the former was not so often borrowed for general transport service of the division, as Sheibyoin had more use for it themselves than did sanitary companies for their transport. Extra transport for patients was hired by Sheibyoin as required. In practice a good deal of extra transportation for patients to the rear was always hired by the intendance officers, under direction of the medical officers in command of Sheibyoin. Sheibyoin, too, usually employed from four to six coolies for the rougher and dirtier hospital work. The method for their employment was the same as that for carts. After a battle field hospitals which were not made Sheibyoin, after some time for rest, if they had been engaged in very hard work, did no hospital duty except something in the line of instructing their personnel. The remarks on sanitary companies, in reference to their success in this particular, apply equally here. Not a very long time elapsed usually before such field hospitals were required for Sheibyoin, then they were promptly moved to the locations where they were needed and proceeded to open, after cleaning the buildings they would occupy. These buildings were usually selected in the town designated by the commander of the hospital or by its intendance officer, who preceded it to its location.

Division organizations in march.—In march division surgeons were habitually found with their commanders. Battalion surgeons accompanied their organizations, their pack animals following immediately in rear with other pack transport carrying the battalion supplies. As in other services in march, battalion surgeons examine men disabled and allow them to march without their equipment or to fall out for

wagon transportation in the rear, etc. An important duty of battalion surgeons on the march is preventing soldiers from drinking unboiled water; line officers, according to Japanese ideas, are too much occupied with other matters to superintend this at this time, though in permanent halts they are mainly responsible for it. In march sanitary companies, which, it should be remembered, have only pack transport, are placed immediately in rear of the divisions to which they belong. A sanitary company in march is 280 meters in length. Field hospitals, by regulations, are in the division train; their position there depends upon whether a battle is expected or not. In the former case they are moved up to the front of the train. Their column is 200 meters in length. Both sanitary companies and field hospitals camp separately. As will be seen later, though the positions in march given above for field hospitals and sanitary companies are regulation, they are necessarily considerably changed for both at times during the course of a battle. Temporary hospitals may be opened in march on the representation of the necessity for them by the division surgeon to the division commander. Their personnel and supplies are obtained in the same manner as those for Sheibyoin.

Division organizations in battle.—Prior to a general engagement division surgeons, in consultation with the chiefs of staff of their divisions, arrange for any extra transportation, etc., which may be required for the service of the medical department. As the first-named officers have all orders of their commanding general, they are in a position to proceed with intelligence. At Mukden a number of extra men were obtained for sanitary companies, and many Chinese coolies were hired; one pack animal was also added to the medical transportation of the infantry battalions. As it was anticipated that Mukden would be a great battle, all the field hospitals that could be secured were thought to be needed for it, so all those pertaining to the divisions were cleared and brought immediately to the rear of the troops. All supplies which could be carried were distributed from the depots to the field sanitary organizations. While this was going on the army chief surgeon informed the line of communication chief surgeon in general terms what would

be expected of him, details being almost entirely left to the latter officer. Mukden is simply taken as a concrete example of what was the general practice, so far as can be learned.

In battle, division chief surgeons as a rule accompany division commanders and are thus in very close touch with them. The commander of the sanitary company is often with the division chief surgeon, who consults with him and directs him in reference to the establishment of dressing stations. The location of field hospitals is also, in practice, largely determined by division surgeons, who frequently have telephonic communication with them as soon as they are opened. Sometimes division medical supply depots are brought from the lines of communication to be put directly under a division surgeon, who supplies his field hospitals from them. As has been noted, this is not the general method of supply. Though for the transport department for patients and the Sanitary Reserve Personnel, communication is usually from division through army to line of communication chief surgeon, it may be direct from the first to the last named.

In battle, battalion medical staffs accompany their own organizations, a part of each establishing a temporary dressing station when this becomes necessary upon the troops going into action and the rest going to the firing line. The practice in regard to what part of the medical personnel should go with the troops and what should remain at the temporary dressing station seemed to vary. Sometimes all medical officers could be found at this station, and at others one or more of them were at the firing line. The chief nurses of an infantry battalion commonly stayed at the station, while the nurses accompanied the troops. On account of the terrific fire to which infantry battalions were subjected, it was practically impossible for the medical personnel with them to move about much on the line during an engagement, but with other organizations they were not held so closely to their places. With the infantry, therefore, as they could only reach men wounded in their vicinity, the medical personnel, whether officers or soldiers, engaged in about the same class of work. There could be no parceling out of bad cases to the surgeons and lighter ones to their assistants.



47. METHOD OF PACKING BATTALION MEDICAL CHESTS, BATTLE OF MUKDEN.



48. METHOD OF PACKING BATTALION LITTERS, BATTLE OF MUKDEN.

It was generally agreed by the Japanese that the services performed by the surgeons on the firing line were of sentimental rather than practical value. These medical officers had a heavy casualty list, but even with the great gallantry which they displayed were not able to render assistance to many wounded. Surgeons on the line are not permitted to use a knife, nor could they do so in practice. Cases of severe primary hemorrhage, for which the skill of a surgeon would be almost absolutely necessary, are fortunately rare with the present rifle bullet. An important lesson is taught by this experience of the Japanese. This is, that on the line, the services of surgeons and even of the medical personnel generally can not be largely depended upon for dressing wounds, and that, therefore, it is necessary to have a good and simple first-aid packet, and to instruct soldiers generally in its use so that they will themselves be competent to apply it to a wound.

Surgeons on the line had no equipment other than that carried by themselves and their nurses, but as a usual thing they stuffed pockets and pouches with extra dressings. In the Japanese field service regulations a first-aid station is provided for, but so far as known these were not established in practice unless the name was held to apply to the places where surgeons and medical personnel with troops were located. Chief nurses and nurses with troops are not called upon to carry patients, so this service between the line and the temporary dressing station is wholly dependent on company bearers. By regulations such bearers are only detailed with the infantry and artillery, but the engineers, at least, also frequently employed them at Mukden. With the infantry on going into battle four bearers from each company habitually marched in rear of their battalion. They were placed at the disposal of the battalion surgeon and on going into action left their rifles at the temporary dressing station, where they obtained litters and the red brassards, as previously stated. So far as could be learned, no difficulties were made by Japanese commanders in regard to permitting the selected men to perform bearer duties; in fact, the former were extremely anxious to get wounded soldiers away from their unhurt comrades. Company bearers did not go

farther to the rear than the dressing station. Reference has also been made to the fact that sometimes, when the number of wounded was very great, the services of these bearers had to be supplemented by other men. This was apparently usually done by a higher commander at the conclusion of an engagement sending whole companies under their own officers to bring wounded to the temporary dressing stations. Of course, a great many wounded were always able to walk back to the stations.

Temporary dressing stations were rarely established, except for the infantry and artillery; they were usually placed from 400 to 500 yards back of the firing line, in the shelter of a village wall, of the bank of a stream, or sometimes of only a Chinese grave. Occasionally they were too much exposed to fire, and their personnel was, in consequence, compelled to seek more shelter farther to the rear. It must be understood, of course, that, while such a station may remain in one place for some time when the troops are checked, when they are advancing the location of the station may change from hour to hour. The location and establishment of these stations are ordered by the commander, but, in practice, this did not prove practicable, so the surgeons opened them, notifying the commander as soon as possible. Division chief surgeons were not informed as to their location. Their situation was sometimes made known to the dressing stations by a rough road sketch sent back by a battalion surgeon, while in other cases bearers from the dressing station notified the personnel of the temporary dressing stations of the location of the former. The number of these stations which were required is a matter of considerable interest. So far as could be learned, while one was not infrequently sufficient for an artillery regiment, each infantry battalion was usually compelled to establish one. The equipment of the station, in addition to that carried by the medical personnel, was contained in the chests carried by the battalion pack animals. Usually, as soon as a station was located, these chests were removed from the animals, placed on the ground, and opened. The question of a sufficient supply of both litters and splints proved an important one, and the wisdom of allowing two pack animals for the medical supplies of a battalion was manifest at Mukden. At these stations no operating was



49. REMOVING WOUNDED FROM FIRING LINE TO TEMPORARY DRESSING STATION, BATTLE OF MUKDEN.



50. TEMPORARY DRESSING STATION, BATTLE OF MUKDEN.

done; dressings were applied or readjusted, and limbs were splinted for the first time, or better splints were put on to support them. Commonly, too, diagnosis tags were here attached to the lapel of the coat of each wounded man. Wounded, unable to walk, were removed from temporary dressing stations by bearer companies, or temporary dressing stations were replaced by dressing stations. So far as known, at Mukden, difficulties arose but seldom from the battalion medical personnel being compelled to follow their organizations before bearer companies came in touch with them so that these companies might assume responsibility for wounded.

In battle, the next organizations on which Japanese wounded are dependent are the sanitary companies. By regulations, each sanitary company is composed of a principal part and two bearer companies, but, in practice, the sanitary companies were divided into halves, which worked independently. The position of sanitary companies in march has already been given. In battle, however, only one-half company, with its pack transportation, was commonly found immediately in rear of its advancing division. The other half usually advanced independently, and the cart transportation, with which sanitary companies were furnished at Mukden (six Chinese carts to a half company), also advanced independently, rejoining its half company after this had halted.

The functions of sanitary companies are twofold: First, the establishment of dressing stations; second, the transportation of wounded from the field to them, and their subsequent removal to field hospitals. One dressing station was opened by each half of a sanitary company. The commander of the company is under the orders of the division commander in matters other than those pertaining to the medical department proper, but, in practice, division surgeons gave specific directions in regard to the establishment of dressing stations. They were then located by the company commander, after consultation with the senior surgeon, and the division surgeon was notified. By regulations, sanitary companies are required to establish dressing stations within 1,000 meters of the firing line; in practice, it was only under the rarest circumstances that they were so close as this, their

usual distance being probably not far from 2,000 meters. Even then, these dressing stations were considerably exposed to fire, sometimes to that from small arms and always to artillery projectiles. During the whole war these stations were generally located in Chinese villages, where the mud walls gave some protection, and where water, etc., could be obtained. The sites of all such stations, in both the Fifth and Eighth Divisions, at the battle of Mukden, are given on the map of that battle, which also shows some of the artillery positions and the lines which the troops occupied. As will be seen, it was practically impossible to avoid the vicinity of artillery positions with them, and apparently no attempt was made to do so, they being jammed forward into the nearest convenient village, where the fire was not too heavy.

When a dressing station was established, its personnel, except the bearers remained in it, with the pack transportation, to care for the wounded arriving, while the bearer companies advanced from it on the field, as far forward as possible, succoring wounded whom they met, carrying those to the station who had become exhausted on their way back, and collecting others well up toward the front. Only a few Chinese were used for service between dressing stations and temporary dressing stations, soldiers being commonly employed here as bearers. The Japanese used no wheeled vehicles for the transportation of wounded from temporary dressing stations to dressing stations, except when the contest had concluded on their front by the Russians abandoning a position. Obviously, in any army, such work must always be largely dependent on bearers, on account of the increased fire to which wagons would be subjected. The distance which wounded required transportation between temporary dressing stations and dressing stations was in round numbers 1 mile, and it was as much as four sturdy bearers could accomplish physically to carry a man so far as this. Litters were almost always carried on the shoulders. The Japanese admit that this method is undesirable, as in case one bearer is wounded the patient will almost inevitably suffer a severe fall. In practice, however, they found that, at the front, where rapid work was required, four men were needed for each litter, and that it must be carried on their



51. HIRED CHINESE BEARERS BRINGING IN WOUNDED TO DRESSING STATION, BATTLE OF MUKDEN.



52. DRESSING STATION, LIAO YANG.



shoulders. The Japanese soldiers, detailed in bearer companies, were supposed to have dressing bags, which contained articles for wounded. Apparently they were by no means always furnished with these bags, but almost universally depended on trained medical personnel for treatment of patients. It was noticed that the bearers carried no extra water for patients, who were usually compelled to wait for a drink until they reached a dressing station. Besides the wounded who were carried to dressing stations, a great many walked back to them, sometimes from the firing line, but more commonly after passing through a temporary dressing station.

The personnel left at the dressing station proceeded as soon as possible to make ready for the reception of patients. From the group of houses taken, certain ones were assigned to each of the four sections by the senior surgeon. These sections, according to the regulations, are the receiving and forwarding, the seriously wounded, the slightly wounded, and that for preparing medicines. A Chinese table was usually taken from one of the houses used for the station and was placed in a compound. This constituted the receiving and forwarding section, where patients were brought and from which they were distributed to their proper sections, or were sent at once to a field hospital. Two or more houses were taken for each of the other sections. Each was marked with a Japanese signboard. Their personnel prepared them for their special purpose, but no attempt was made to clean them; in fact, this would have been impossible. In the compound of the receiving and forwarding section a few mats were placed on the ground, so that patients might lie down while awaiting disposition. A fire was also usually made here, and some tea was prepared, but neither here nor in other parts of the station were foods or stimulants available in quantities, which it would have been perfectly practicable to prepare, and which must have greatly benefited patients. Wounded brought to the receiving and forwarding section by the bearer companies usually had their arms and accouterments, as did also some of those who walked in from the field. Bearers are required to bring in wounded who die en route, and a number of such men were seen arriving at dress-

ing stations. Great care was taken to safeguard the valuables and personal property of dead and those wounded who were unable to take care of their own possessions. An intendant noncommissioned officer in the yard of the receiving section examined all such men and took their property, carefully listing it in the presence of one or two other men.

At the receiving and forwarding section diagnosis tags were also attached to each man's coat, if this had not been done before. Serious and slight cases were separated with a good deal of care. When the patients reached the wards they were wrapped in blankets and laid on the khans. At Mukden, when possible, fires were made, at least in the wards for severely wounded. Some wounded were first dressed at the dressing station, where a good many dressings were readjusted. Better splints or first splints were also fitted for wounded requiring them. While the Japanese say that they were prepared to do all necessary operations at dressing stations, in practice scarcely any operating was done in them, nor was this desirable, as conditions for clean work were impossible of attainment. The question of supplying sufficient splints and litters also proved important here. Though 40 of the latter was the regulation allowance for one-half of a sanitary company, many of them had from 90 to 100. By regulations, sanitary companies are enjoined to be prepared to establish and to close stations quickly, and they did both with commendable promptness.

Wounded sent from dressing stations to field hospitals, when able to do so, walked, in charge of their highest rank man. Patients who required to be carried were transported on litters, borne almost always on the shoulders of Chinese coolies, several parties being under charge of one Japanese bearer. As long as the services of bearers were required at the front little attempt was made to move wounded to field hospitals. Not infrequently field hospitals replaced dressing stations and relieved the personnel of the latter from further responsibility for patients. Field hospitals so replacing dressing stations replaced property left behind by the latter.

The last field medical organizations which require description are the field hospitals. Their position in march has already been given. However, in a long-continued battle,



54. TRANSPORTATION OF WOUNDED BY CHINESE BEARERS,
BATTLE OF MUKDEN.



55. TRANSPORTATION OF WOUNDED ON CHINESE CARTS, BATTLE OF MUKDEN.



56. TRANSPORTATION OF WOUNDED ON ORDINARY JAPANESE CARTS, BATTLE OF MUKDEN. NOTICE THE KAOLIANG STALKS ON THE BED OF THE CART.



57. TRANSPORTATION OF WOUNDED ON FOUR-WHEEL JAPANESE
CART, BATTLE OF MUKDEN.

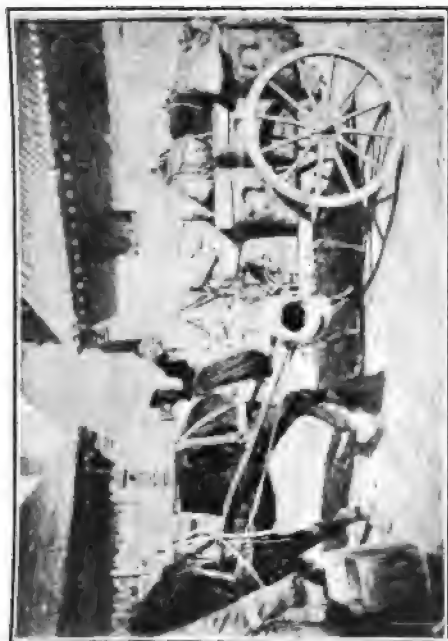
such as Mukden, field hospitals were necessarily established only to be moved more than once later, so that they were often advanced independently of their divisions. Their extra transportation at that battle also moved forward independently of the division train just as did that of sanitary company halves. In practice, division commanders paid little attention to sites for field hospitals, which were directed as to their general location by division surgeons, the hospital commanders themselves determining exactly where they should open. The buildings for them were selected by their commanding officers or their intendants officers. The number of field hospitals which should be opened was left to the judgment of the division surgeon. Sometimes all of those pertaining to a division were put in operation. On other occasions some were held in reserve or only halves of certain hospitals were opened, the other halves being held in reserve. It was never, of course, possible in practice for division surgeons to divide a division into four parts and to appoint one field hospital to receive the wounded from one of these fourths, and the methods pursued in the different divisions in regard to the use made of the field hospital organization undoubtedly differed considerably. Regularly in the Eighth division at Mukden the field hospital for the most advanced position was determined by roster, and one or more of the other field hospitals were placed in a near-by village to receive the overflow from the one at the front. Field hospitals nearest the enemy were not often located closer than at about the extreme range of shell fire, say at about 7,000 yards from the Russian artillery. As they were necessarily established where houses were available, their exact distance from the front varied somewhat, but so far as possible heavy fire was avoided, as were also artillery positions, though sometimes in the changes of a battle, hospitals found themselves directly in the rear of batteries. Division surgeons were immediately notified of the opening or closing of field hospitals, and the hospital in advance was expected to notify the dressing stations of its location. Field hospitals were frequently in telephonic communication with division headquarters and sometimes with sanitary companies.

As may be seen in the Field Service Regulations for the Medical Department, field hospitals are divided into a great number of sections. Most of these sections were actually established when field hospitals were immobilized as Shei-byoin, but in battle their organization was much simpler, hardly more elaborate than that for dressing stations. A good many more houses were necessarily taken for field hospitals, however, usually from 15 to 20. The receiving and forwarding section was located in the compound of one of the houses, just as were those of dressing stations. Patients arriving were distributed within the field hospital or were sent immediately to the rear. Separate sections were organized for serious and slight cases, a house or two was set aside for the apothecary department, a house and compound for the kitchen, houses for the personnel, and an operating room was prepared, and some rooms for the shelter of the dead. Practically no attempt was made to clean the houses selected for the hospital except the one used as an operating room. Tents were not infrequently used for operations in summer, but in winter they were always employed for stores, as the weather was too cold then to put patients in them. Kitchen facilities at field hospitals were much more elaborate than at dressing stations. Most of the wounded from dressing stations and a few who had missed them and came directly from the field reported at the field hospitals in advance. While by regulations each field hospital was only expected to care for 200 patients, in all the great battles of the war not much less than 600 were actually cared for; these hospitals therefore carried greatly increased supplies of food and dressings. Very little operating was done in the field hospitals during the battle of Mukden. Personally I saw only one cutting operation. This was a perineal section in a man who had received an abdominal wound and had retention of urine. A great many extensive dressings, however, were made in the operating rooms of the field hospitals. Sometimes wounded first received diagnosis tags at the field hospitals, but generally their daily history sheets were started here. These then accompanied men to the rear, finally reaching Japan with them. Advanced field hospitals only retained wounded whom it was absolutely impossible to transport,



58. SLIGHTLY WOUNDED PATIENTS ARRIVING AT AN ADVANCED FIELD HOSPITAL, BATTLE OF MUKDEN.





60. METHOD OF CARRYING CHESTS AND SOME OTHER SUPPLIES OF A
FIELD HOSPITAL, BATTLE OF MUKDEN.

sending all others promptly to field hospitals of the same division in the rear. For this the transportation of the field hospital was used, and in the last days of Mukden all returning transportation of the division was borrowed for this purpose by authority of the division commander. Field hospitals in the rear used their own transportation to some extent to evacuate patients to rest stations or to stationary hospitals, and Chinese carts were freely employed for this purpose. Early in the battle the transport department for patients was able to clear the field hospitals promptly, and stationary hospitals replaced some of them. As the days went on, however, the accumulation of wounded increased, but though every available means of transportation was necessarily used, there never occurred a time at Mukden when some field hospitals were not prepared to advance. One actually did accompany the Eighth division to the north. Wounded going back were put in charge of the highest ranking man among them, to whom all the daily histories were intrusted for delivery to the authorities of the hospital, where he reported the wounded. While it was not necessary for field hospitals to be prepared to open and close as quickly as dressing stations, the former did good work in this particular. The reports of both sanitary companies and field hospitals on their work were models in their way. While it was considered more desirable that these reports should be complete than that they should be rendered quickly, they were received promptly by division surgeons. In order to make the journey from field hospitals to the rear somewhat easier for patients transported by wagon, kaoliang was put on the beds of Japanese carts or Chinese wagons, so as to give them a little spring.

As it was much easier to discuss the medical department at the front without complicating the subject by referring to nondivisional organizations, this plan has been the one adopted, but it should be noted that all separate organizations also had their medical personnel. Each Kobi brigade had its surgeon, an officer with the rank of major, and 1 assistant, with an office force consisting of 1 chief nurse and 4 detailed soldiers. The regulation allowance of field hospitals to a Kobi brigade was 2, though in practice frequently

but 1 was attached to it. Each such brigade had one-half a sanitary company. The medical personnel for the Kobi brigade came from the active army largely, just as it did for the division organizations.

In order to complete the subject under discussion, a few words must still be said in regard to removal of wounded from the field. When the Japanese troops were advancing, wounded were succored almost immediately by the medical personnel and the company bearers with their organizations, and were then quickly taken in charge by the bearer companies. During most of the fights at Mukden, so far as observed, the majority of wounded received prompt attention from their battalion personnel. Sometimes, of course, it was not possible for men to get back to the temporary dressing station, and some wounded in specially exposed positions could not be given attention until nightfall. Though the bearer companies worked up toward the front during the day and collected many wounded then, when the Japanese lines were in very close contact with the Russians sometimes many wounded could not be collected till nightfall. The bearer companies then worked during the night, using their acetylene lanterns when their nearness to the enemy did not prevent, otherwise stumbling about in the dark to find wounded, in order that they might be brought back to the dressing station. At the field hospitals, too, the personnel was almost always more occupied with patients during the night than by day. At Mukden, except for the small number of men who fell so near the Russian lines that the Japanese bearers were absolutely unable to get to them, nearly all wounded were collected and brought to field hospitals within twelve hours after they were hit. While there, on account of the cold weather, wounded men on the field suffered extremely, the service of the medical department was so good that there were only about 200 cases of frostbite in the Second Army, and the majority of these occurred in the wounded who had fallen into the hands of the Russians on the extreme left. Fortunately for the wounded at Mukden there was nothing to obstruct the view of the bearers. Opposite conditions obtained at Liaotang, where at least one poor man was not discovered in the high kaoliang until eleven days had elapsed.

TABLES AND SCHEMES ON MEDICAL DEPARTMENT ORGANIZATION.

The following tables and schemes show graphically and in detail the organization of the Japanese medical department. Repetitions have not been avoided whenever it was thought that making them would promote clearness:

Administrative offices

Office, Chief, Medical Bureau, War Department, and Inspector General of Field Sanitation.

Offices, division surgeons, at home.

Office, chief surgeon, Liaotung garrison.

Offices, surgeon-generals of armies.

Offices, line of communication chief surgeons

Offices, division surgeons in field.

Offices, chief surgeons, Kobi brigades.

NOTE.—There was no administrative office of the medical department at Manchurian headquarters. The medical officer there was only a medical attendant, with certain duties in respect to sanitation.

Directly:

Army medical school.

Medical supply depot.

Medical inspectors.

Medical service at—

Military quarantine Station.

Hospitals for prisoners of war.

Direction of, so far as medical service is concerned:

Division surgeons, at home.

Chief surgeon, Liaotung garrison.

Army chief surgeons.

Chief surgeons, lines of communication of armies, in part.

Supply to:

Manchurian store, medical section.

Chief, Medical Bureau, War Department, Inspector-General, Field Sanitation.

Rank, lieutenant-general.

Office, 2 divisions, sanitary and medical.

Two assistants, a colonel and a captain, and a large force of clerks.

The staff of the army medical school was also used for assistants to this officer.

Makes estimates for expense of own department annually and an annual report.

Makes general arrangements with the director of transportation and communications in regard to hospital ships, transports for patients and trains; also with chief intendant officer in regard to matters in which that department touches his own.

Regulates when Red Cross shall be employed.

Division surgeon at home.....	<p>Colonel, may be reserve surgeon-general. Two assistants, one of whom may be a major, or both of lower rank, and about 8 clerks. Makes specific arrangements for hospital trains with station commander.</p>	<p>Directly: Division hospital. So far as medical service is concerned: Surgeons of fortresses. Surgeons with troops in division. Surgeons at military schools. General arrangements for aid stations established in the division by the Red Cross and the Ladies' Association.</p>
Director, division hospital.....	<p>Rank, lieutenant-colonel. Assistants, from 2 to 4 officers, highest ranking not above grade of major. Clerical force very variable; always several chief nurses.</p>	<p>Direct command: Principal hospital. Directly: Branch hospitals. Convalescent camps. Receiving hospitals at ports where established.</p>
Chief surgeon, Liaotung garrison...	<p>Rank, colonel. Three assistants, one with the grade of major, other two of lower rank, and about 12 clerks. Special arrangements in regard to shipping patients on hospital ships with port commander, and some general arrangements for train transportation of patients with chief of department of communication and transportation.</p>	<p>Directly: Line of communication hospitals in the garrison. So far as medical service is concerned: Surgeons on duty with troops in garrison.</p>
Surgeon-generals of armies.....	<p>Rank of surgeon-general, major-general. Two assistants, one with rank of captain and the other of lieutenant, 3 chief nurses, and from 5 to 10 detailed soldiers. General arrangements with chief of staff in regard to transportation in excess of regulation allowance and the like.</p>	<p>So far as medical service is concerned: Line of communication chief surgeons. Division chief surgeons. Chief surgeons, Kobi brigades. Surgeons, troops attached to army.</p>

Chief surgeons, lines of communication of armies

Assistants, 2 or 3 officers, one of whom may have grade of major, others of lower rank.

Three chief nurses, about seven detailed soldiers

Makes arrangements with chief of staff and station commanders in reference to means for transportation of wounded.

Frequent communication with division chief surgeons in reference to medical service.

Directly:

Directors, line of communication hospitals.

Army medical store.

Division medical stores.

Sanitary Reserve Personnel. (Stationary hospitals.)

Transport department for patients.

Laboratory.

Rest stations.

So far as medical service is concerned:
Surgeons on duty with troops.

Division surgeons in field (chief sanitary inspectors)

Two assistants, 1 captain and other lieutenant, 2 chief nurses and 1 nurse, about 7 detailed soldiers.

Arrangements with chief of staff for extra transportation, etc.

Frequent communication with chief surgeon, lines of communication for arrangements in reference to medical service.

Directly:

Sanitary companies.

Field hospitals.

In reference to medical service:

Surgeons on duty with troops.

Chief surgeons, Kobi brigades

Rank, major.

One assistant, captain or lieutenant, about 2 chief nurses, 4 detailed soldiers.

Duties like division chief surgeons.

Directly:

Sanitary companies.

Field hospitals.

In reference to medical service:

Surgeons on duty with troops of brigade.

Table showing sanitary organization of a Japanese division in war.

Division.	Medical department.							Line and train officers and soldiers.					In-		Company bearers.	Additional personnel at Mukden.			Transportation.											
	Colonel.	Lieutenant-colonel.	Majors.	Captains or lieutenants.	Apothecary officers.	Chief nurses.	Nurses.	Assistant nurses.	Major.	Captains or lieutenants.	Noncommissioned.	Privates.	Captains or lieutenants.	Noncommissioned.		Total, without bearers.	Total, with bearers.	Hired Chinese bearers.	Hired Chinese drivers.	Total hired.	Actual grand total, Mukden.	Japanese carts.	Mounts.	Pack animals.	Total animals.	Hired wagons, Mukden.	Draft animals hired.	True total carts, Mukden.	True total animals.	
Medical staff.....	1					2	1					7			13	13					13	1	1	8		4			1	4
Infantry, 4 regiments (2 brigades).....						12	48								84	276					276			24	48					48
Cavalry, 1 regiment.....						2	1								6	6					6			6	6					6
Artillery, 1 regiment.....						3	1								12	36					36			8	4					7
Engineers, battalion.....															24															
2 companies.....						1	2								5	5					5			2	2					2
Telegraph section.....						1	1								3	8					8			1	1					1
Bridge section.....						1	1								3	8					8			1	1					1
Troop, 1 battalion.....						4	2								11	11					11			4	4					4
Sanitary detachment.....						1	26								546	146					780			14	64					102
4 field hospitals.....						4	20								408	408					488			92	20					272
1 ammunition battalion.....																														
1 ammunition battalion.....																														
2 artillery ammunition columns.....						2	2								8	8				8			2	2						2
2 artillery ammunition columns.....						2	2								8	8				8			2	2						2
1 infantry ammunition columns.....						4	4								16	16				16										4
Total.....	1	4	76	5	78	185	140	1	3	26	671	5	5	216	1,123	1,339	160	104	264	1,603	89	93	86	68	247	52	208	141	456	

REMARKS ON TABLE.

In addition to the sanitary organizations here given three others are mobilized with each division, though they remain in the lines of communications. These are the Sanitary Reserve Personnel, the transport department for patients, and the division supply depot; their organization will be found on a subsequent page.

Variable numbers of soldiers were detailed as orderlies, etc., at offices of division surgeons. These usually, but not invariably, came from the train. They averaged between 5 and 10; for the table 7 has been taken as their number.

Company bearers, by regulations, are detailed and instructed in the proportion of 4 to each infantry company and artillery battery. These men were used to a considerable extent for carrying wounded in the battle of Mukden. In addition company bearers were certainly detailed from the engineers and possibly from other organizations. The latter have not been entered on the table.

The sanitary detachments, by regulations, had but 320 bearers, but this number proved insufficient in practice, and 80 train soldiers were added in the Second Army at least.

An instrument repairer is included in the assistant nurses of each field hospital.

MEDICAL DEPARTMENT WITH TROOPS.

Personnel.—This is shown in the general table of organization of a Japanese division mobilized. The rank of chief nurses is not regarded with battalions, etc. Company bearers of the infantry and artillery regularly, on going into battle, march in rear of their battalions. It should be noted that chief nurses and nurses never carry patients during a battle. Men detailed as bearers armed with the rifle carry it until they actually begin such duties, when they leave it at the temporary dressing station.

Supplies.—Troops mobilized obtain their regulation allowance of supplies from the division depots. Articles other than medical supplies are thereafter obtained through their commanders. Thereafter medical supplies are furnished on monthly requisitions, which go to the division surgeon. Usually this officer directs that supplies shall be obtained from such and such a field hospital or sanitary company, but sometimes, when more convenient, the issue may be direct from a division supply depot, the direct order for the issue being then given, by the line of communication chief surgeon.

Only the infantry, artillery, and the transport columns have medical chests, the other branches of the service depending on medical supplies carried personally by the nurses and chief nurses with them. Medical supplies so carried are nearly all found in the pouches, but some splints are placed in the knapsacks, and the Esmarch tourniquet is carried en bandolier. In the infantry four medical chests are supplied to each battalion. Those carried immediately in rear of the battalions are described under the head of infantry chests in the table of supplies. Extra articles are carried in the chests, which are there noted as being especially for maneuvers, but also as affording an extra supply in war. These go with the heavy transport, as does also the third artillery chest. The chests for transport columns are placed on a wagon. The regulation number of dressings for the establishment of a temporary dressing station by an infantry battalion is 100, but this number did not prove sufficient, and battalion surgeons were in the habit of packing into their chests all the extra dressings which they would hold. An artillery regiment has 150 dressings; a cavalry regiment,

100; a battalion of engineers, 100; a telegraph company, 100, and a transport column, 100. These have all proved sufficient.

Troops carry no litters. All these are transported on medical department pack animals immediately in rear of the battalion. At Mukden infantry battalions each had from 8 to 10 litters.

Regulation transportation.—This is also given in the table of division organization. It will be noted that no chief nurses or nurses are mounted except with the cavalry. At Mukden it was found necessary to use two pack animals for the medical supplies of each battalion instead of one, the regulation allowance. The battalion allowance of medical supplies is a sufficient load for one pack animal, and extra litters and the chests could not have been transported by one pony.

SANITARY COMPANY.

Each division has a sanitary company, which is mobilized with it. Each Kobi brigade has one-half of such a company, which is mobilized in the same manner. According to the Japanese regulations, each sanitary company consists of a principal part and two bearer companies. There are no sanitary companies for cavalry divisions, but if needed, they would be attached to them.

Personnel.

Principal part:

- 1 major, line or train, mounted (commander).
- 2 senior medical officers, captains, mounted.
- 6 junior medical officers, lieutenants, mounted.
- 1 apothecary officer, lieutenant.
- 1 intendance officer, lieutenant, mounted.
- 1 chief clerk, noncommissioned, line.
- 10 chief nurses, noncommissioned.
- 26 nurses, privates.
- 3 chief nurses, assigned with apothecary officer.
- 1 intendance, noncommissioned.
- 1 train, noncommissioned, in charge of transport, mounted.
- 1 saddler.
- 1 shoemaker, train.
- 1 tailor.

Principal part—Continued.

40 train soldiers, with pack animals.

2 servants, train soldiers.

10 grooms, train.

Two bearer companies:

3 line or train officers, 1 captain, 2 lieutenants,
all mounted.

2 senior noncommissioned, line.

16 noncommissioned, line, section commanders.
etc.

2 buglers, line.

2 blacksmiths, train.

2 chief cooks, noncommissioned, line or train.

8 cooks, line or train.

320 bearers, privates, line (regulation).

80 bearers, train (added at least in Second
Army).

3 grooms, train.

546 total.

Additional personnel, hired, Mukden:

160 Chinese bearers.

24 Chinese drivers.

Grand total, Mukden, 730

While the personnel, as given, is probably not absolutely correct, it is certainly a close approximation to the true figures. The division of the sanitary company into a principal part and two bearer companies is rather an artificial one. This is according to the Japanese, however, and was natural enough under the old plan for the operation of these companies. In this it was contemplated that a dressing station would be established by the principal part, from which one bearer company would work to the front, toward the troops, and the other back to the field hospitals. In the recent war, however, the sanitary company was divided into halves, each of which established its own dressing station and devoted itself, first, to bringing in wounded from the front, and afterwards, when this was completed, or when some of the personnel was no longer occupied in it, to clearing the dressing station into the field hospitals, hired Chinese being principally employed for the latter work. The more natural division of a sanitary company now would therefore be into these independent halves, again dividing each half into a dressing station section and a bearer section.

Supplies.—A sanitary company, mobilized, is completely equipped from the division depots. Medical supplies in the field are obtained by requisition on the division surgeon. They come from a division medical supply depot, the order for their issue being given usually by the chief surgeon of the lines of communication. Articles having to do with transportation, animals, etc., come from the division commissariat depot. Extra transportation, including coolies, may be hired by the intendance officer, on order of the commanding officer of the company.

Regulation supplies.—It is intended that everything be in duplicate in order that the company may be divided into halves. The supplies are 16 chests (the contents may be found in the table of sanitary supplies), 2 folding operating tables, 10 or 20 acetylene lanterns, 80 litters, 8 kettles, and cooking utensils for boiling rice, food, 2 days for personnel, carried personally, 1 day for personnel and 100 patients, in light baggage, and 4 days for same in train, 1 day's forage for animals, 1 iron, 2 in light baggage, 4 in train.

Extra supplies.—These are not fixed but depend on what the division surgeon thinks will be needed in each battle. Litters were much increased at Mukden, on account of the experience of the earlier battles of the war; each half sanitary company was found to have 90 of them. The regulation allowance of dressings to each dressing station is 600; at Mukden, each had more than 1,000. Extra splints were also carried. So far as known, no necessity was found for increasing the medicines. Much more than the regulation allowance of food was found on hand.

Regulation transportation.—Forty pack ponies, which may be replaced by 24 Japanese carts.

Extra transport at Mukden.—Twelve Chinese carts, with 4 animals each.

Animals, Mukden.—Forty-eight draft, 40 pack ponies, 14 mounts; total, 102.

Remarks.—The commander of a sanitary company, by regulations, is directly under command of the division commander, the division surgeon only directing the former so far as the medical service is concerned. In practice, division commanders were so much occupied with other matters that division surgeons virtually directed the commanders of these

companies in reference to all details of their service. The commander of the company commands the whole and also one-half section directly, the latter, however, not infrequently falls on the lieutenant, while the commander remains with the division surgeon, so that the work of both half sections may be better supervised. At the end of an action, reports are made both by the bearer companies and by the dressing stations. These go to the commander of the company, who transmits them, with any remarks he may desire to make, to the division surgeon.

FIELD HOSPITAL.

Each division, by regulations, has six field hospitals, but in the recent war this number could not be supplied on account of shortage of medical officers. Therefore four was the number determined upon, and in practice some of the divisions had but three. A Kobi brigade should have two field hospitals, but it is doubtful if, in reality, more than one was ever supplied to any of them. Cavalry divisions do not have field hospitals, but these may be attached to them when required.

Personnel.

1 surgeon, major (commander).
 1 assistant captain surgeon.
 4 surgeons, lieutenants.
 1 apothecary officer, lieutenant.
 1 intendance officer, lieutenant.
 9 chief nurses.
 6 nurses.
 34 assistant nurses.
 1 instrument repairer.
 1 intendance, noncommissioned.
 6 cooks, train.
 1 noncommissioned, train.
 2 assistants, privates, train.
 31 train soldiers for general work.
 3 servants, train.

102 total.

Additional personnel, hired at Mukden:
 20 Chinese drivers for extra carts.

Grand total, Mukden, 122

Each field hospital at Mukden also employed four or five Chinese coolies for work around the kitchens; these have not been entered in the total.

Supplies.—See general remarks under sanitary company.

Regulation supplies.—It is intended that these hospitals shall be divisible into two parts; so all essential articles are in duplicate. Each hospital has 12 chests (the contents may be found in the table of sanitary supplies; it will be noted that they are very complete), 200 blankets, 200 bed sacks, 2 operating tables, 2 instrument sterilizers in chests, 1 microscope in case, 1 camera in case, 2 acetylene bicycle lanterns, a small quantity of calcium carbide, 2 hatchets, 2 mauls, 2 tents, large, and 4 small, food and forage, as in a sanitary company, except for 200 instead of 100 patients, 8 kettles for boiling rice or water, and cooking utensils, 6 woven baskets for water, and 34 litters. No. 1 field hospital has an apparatus for the bacteriological examination of water and No. 3 an X-ray apparatus. A few articles also belonging to field hospitals, by regulations, are retained in the lines of communication until the division surgeon thinks them needed at such hospitals, immobilized. The most important of these is the portable sterilizer for bedding and clothing. At the latter part of the war two chests, containing a good and complete outfit for the examination of water, were also sent to each field hospital.

Extra supplies.—Like the sanitary company, these are not fixed, but depend on what the division surgeon thinks will be needed in each battle. At Mukden the field-hospital supplies were enormously increased, about five times the regulation weight being carried. In each field hospital 1,200 blankets were on hand there, some additional bed sacks, 400 or more dressings instead of the regulation 200, much more food, and somewhat more forage. Medicines were also furnished in slightly increased amounts. A number of articles, which have not yet been specified, were also found at field hospitals, immobilized. The most important of these were mosquito netting, and an increased number of bed pans, urinals, etc. Disinfectants were also provided liberally for them by the medical department.

Regulation transportation.—Each field hospital: Twenty-two Japanese carts.

Extra transport at Mukden.—Each field hospital: Ten Chinese carts, with four animals each.

force is probably only approximately so. At Mukden, so far as observed, this organization depended on hired Chinese carts for its transportation. About 50 such carts were employed there. Each of these had two Chinese drivers, so that, to find the total personnel, 100 drivers should be added for that battle. Moreover, about 12 Chinese coolies were hired for rough and dirty work with each such unit at Mukden.

Supplies.—See general remarks on department for transporting patients. Each Sanitary Reserve Personnel had 3 types of chests; the total number of chests is 9. These are divided into 3 sets of 2 chests each, which are identical with the *A* and *B* chests of the field hospitals and are intended to replace them when necessary. The other three chests are peculiar to the Sanitary Reserve Personnel. Their contents may be found in the table of sanitary supplies. In addition, at Mukden a large amount of matériel was added, making the total supplies carried by the Sanitary Reserve Personnel there about three times that carried by each field hospital. As it is intended that each Sanitary Reserve Personnel shall be divisible into three parts, all essential articles are supplied to it in triplicate.

Transportation.—As stated at Mukden, so far as observed, the Sanitary Reserve Personnel depended on carts hired for its transportation. The amount of matériel which will be required at an expected battle is determined upon by the army chief surgeon and the line of communication chief surgeon. Arrangements for hiring carts may be made either by the former, with the army chief of staff, or by the latter, in consultation with the chief of staff of the lines of communication. Carts and coolies, when needed, may be also hired directly by the intendance officer of the Sanitary Reserve Personnel, on order of its commanding officer. The total number of animals at Mukden was about 200, exclusive of the mount of the commanding officer.

Remarks.—During battles it is intended that the Sanitary Reserve Personnel, which is always kept well up to the front in the lines of communication, shall either replace field hospitals or shall be located at points with good buildings, etc., for the care of patients, to which they may be brought from several field hospitals. The stationary hospitals, thus established by the Sanitary Reserve Personnel, by regulations

are obtained on monthly requisition to the line of communication chief surgeon, who orders the issue from a reserve medical store of the army or of a division or from a line of communication hospital. Each department for transporting patients has by regulations: Six chests of same type as those carried by battalions immediately in their rear; 200 blankets, about; 200 bed sacks, about; 200 to 300 litters, number not fixed (a great many of those used were improvised); food for patients, consisting of canned milk and eggs and other articles which can be purchased.

Remarks.—This organization not only transports patients from field and stationary hospitals during an engagement, and from all hospitals near the front to the railway line at other times, but also establishes rest stations for the temporary shelter and treatment of patients on the way.

Transportation.—The officer in charge and the three medical officers are mounted, as is also the noncommissioned officer in charge of transportation. Many carts and hundreds of coolies are employed as needed.

SANITARY RESERVE PERSONNEL.

Each division has one unit, which is denominated the Sanitary Reserve Personnel. This is mobilized with the division, but remains in the lines of communication, under the direction of the chief surgeon of that organization. It is capable of division into three parts:

Personnel.

- 1 surgeon, major, mounted (commander).
- 3 surgeons, captains.
- 6 surgeons, lieutenants.
- 3 apothecaries, captains or lieutenants.
- 1 intendant officer, lieutenant.
- 27 chief nurses.
- 90 nurses and assistant nurses.
- 3 instrument repairers.
- 3 intendants, noncommissioned.
- 48 train soldiers for cooks, laborers, and general work.
- 8 servants.
- 1 groom.

Total, 197

The officers and the total personnel are known to be absolutely correct, but the detailed statement of the conscript

recent war this was a branch of the Manchurian store, but, as will be seen later, at one time in the Second Army at least, an army medical department storehouse was established, from which division medical depots were supplied. The application for medical supplies is made to the chief surgeon of the lines of communication, who orders the issue. Supplies issued in this manner are reported to the commander (inspector) of the lines of communication.

Each division medical supply depot has 18 chests, each 6 of which are identical with the 6 chests of each field hospital. The contents of these must not be used, as they are intended to replace field-hospital chests captured or lost. Forty-five other chests are also found in each division medical supply depot—that is, 3 sets of 15 chests each. The contents of these may be found in the table of medical supplies. It is intended that most articles required to fill requisitions made on the depot will be filled from these chests. The division depots also were usually found to be carrying considerably more medical department supplies in ordinary boxes. Litters were also on hand in them in large numbers. Their allowance of bedding and hospital clothing is stated to be 30 bales of each. Twenty blankets are usually baled together in Japan. Usually the sterilizers, etc., belonging to the field hospitals are kept in these depots until they are required by the former. The depots also have stills in which water for chemical use is distilled, as is also alcohol from Chinese brandy.

Regulation transportation.—Fifty Japanese carts, 50 draft animals.

Extra transportation.—Chinese carts, hired as required.

Remarks.—It is apparently customary in the Japanese service to furnish ample supplies from these depots to the field hospitals and sanitary companies before a battle, and then not to call upon the depots to any great extent until the fight is over. Though supplies are almost always issued from the depots on order of the chief surgeon of the lines of communication, a depot, or one or more of its sections, may be put under the orders of a division chief surgeon, so that he may directly supply field hospitals and the sanitary company of the division from it. All or only a part of the division medical supply depots pertaining to an army may

be put in operation, according to the necessities of the particular case as determined by the army chief surgeon.

ARMY MEDICAL SUPPLY DEPOTS.

This depot is not described in the Field Service Regulations for the Medical Department of the Japanese army. Such a depot belonging to the Second Army was, however, in existence at Tiehling in September, 1905, and the other armies were said to have them at that time.

Personnel.

- 1 lieutenant of line or train, reserve (commander).
- 1 surgeon, lieutenant.
- 3 chief nurses.
- 3 nurses.
- 1 intendance, noncommissioned.
- 8 train soldiers, for general work.
- 50 drivers, train soldiers.

Total, 67

In addition, Chinese carts, with drivers, were employed as required.

Supplies.—It was stated that this depot obtained its transportation from the lines of communication. Articles having to do with such transport were replaced from a train depot on the lines of communication. Chinese carts were also freely hired by the depot commander. The medical supplies came from a branch of the Manchurian army store, or possibly from the store itself. Supplies of this character were furnished in the same manner as are division medical depot stores, which come from the same source. The medical stores at the army depot comprised everything which was likely to be needed by medical department organizations in the field. They were not distributed in chests, as is the case at the division medical storehouses, but, on the contrary, were in ordinary packing boxes or bales. Some few, at the Second Army storehouse, were arranged on shelves, but there was no compounding of medicines. The Second Army storehouse at Tiehling occupied one mat shed and about 7 Chinese houses. It was stated that this depot had 60,000 blankets for patients on hand, and obviously there were great numbers of these, as they filled several houses. A large quantity of quicklime was also seen, otherwise the stores were similar to those of a division depot without the chests.

Transportation.—Fifty Japanese carts, 50 draft animals. In addition, as stated, Chinese carts were hired as required.

Remarks.—It will be noted that the personnel and transportation of this army medical store was quite like that of the division depots; the former had, however, an apothecary officer not a medical officer. The medical supplies were not as similar as the personnel and transportation, but they were not very different. It was thought at first that the medical storehouse at Tiehling must be a division depot, but an official statement to the contrary was received, and it was stated that all the division depots of the Second Army were open and that this storehouse had been placed at a convenient place on the railroad, with all these division depots within 20 miles of it, so that medical supplies could be promptly sent from the army to the division depots and then quickly distributed by the latter to the field hospitals and the sanitary companies.

LINE OF COMMUNICATION HOSPITALS.

The line of communication hospitals of Liaotung garrison and those of the separate armies may be considered together, so far as their personnel and supplies are concerned. At the end of the war, as has been stated, the line of communication hospitals in Manchuria, so far as known, provided accommodation for about 24,000 patients.

Personnel.

The difficulty of estimating the personnel for these hospitals was very great. Not only was it extremely difficult to learn anything in regard to this from the Japanese authorities, but changes were necessarily so frequent that what was true to-day might not be so to-morrow. The following figures, therefore, only represent the best obtainable information from all sources and from personal observation:

- 175 surgeons.
- 40 apothecaries.
- 175 chief nurses.
- 1,750 nurses.
- 7 intendance officers.
- 40 intendance, noncommissioned.
- 800 employees for lower class work.

Total, 2,987

At the end of the war no great number of cases were coming from the front, so that not many Chinese coolies were employed as bearers, but when required these were hired

freely as needed. At Tiehling, and also at some of the other stations where hospitals were located, train soldiers performed bearer duties.

Supplies.—Supplies for these hospitals are fixed, in a measure, but considerable latitude was apparently allowed. Requisitions went to the chief surgeon, who ordered the issue from the Manchurian storehouse or from one of its branches. A report of the issue was made to the commander.

HOSPITAL SHIPS AND TRANSPORTS FOR SICK AND WOUNDED.

It will be remembered that the Japanese had 20 of the former class of ships in commission. These were of from 2,500 to 3,000 tons burden, and carried from 250 to 450 patients. It is stated that they also employed 6 of the larger European liners, of about 6,000 tons, as transports for the conveyance of sick and wounded to Japan. Each of the latter carried from 1,500 to 2,000 patients.

Personnel.

Hospital ships (a close approximation):

110 surgeons.

48 apothecaries.

20 chief nurses.

1,014 nurses, men and women, Red Cross clerks, etc.

1,192 total.

Transports (estimated):

24 surgeons.

6 chief nurses.

60 nurses.

90 total.

Grand total, 1,282

Supplies.—The supplies of the hospital ships, while sufficient, were not very liberal, as it was not intended that they should ever serve as base hospitals, but should simply be used to carry patients as rapidly as possible to places where their treatment could be better provided for. The supplies of the transports were even more restricted, as they carried cases which did not require care to the extent that those did who came by the hospital ships. Instruments and drugs on the latter were commonly contained in chests similar to those provided for battalions. The medical supplies for both

classes of vessel came from the division hospital of their port of departure in Japan—that is, almost always from the hospital of the Fifth Division at Hiroshima. General authority was granted for such issues, so that the hospital director was called upon for needed articles when the ships arrived without any further formality.

MILITARY QUARANTINE STATIONS.

The more important quarantine stations were located at Niroshima and Dairi. As the former was near Ujina, the principal port, it was much the larger. The stations each had two sections, one for disinfection, while the other comprised the quarantine hospital. The capacity of Niroshima for disinfection was 8,000 men, with their effects, in one twenty-four hour day. Eighteen hundred soldiers could be cared for in the quarantine hospital, and 4,000 could be segregated.

Personnel.

Each of these quarantine stations was under command of a reserve officer of the line or gendarmes of high rank, who worked under the orders of the quarantine bureau of the war department. Medical officers were in charge of each of the sections. Exact figures for the personnel of the stations were not obtainable. The following are, therefore, only an estimate:

- 2 commanding officers.
- 35 medical officers.
- 8 apothecary officers.
- 4 intendance officers.
- 800 chief nurses, nurses, laborers, coolies, etc.

Total, 849

Supplies.—The supplies at these stations were liberal and included much disinfecting apparatus and disinfectants. They were apparently nearly all obtained from Tokyo.

MEDICAL SUPPLY DEPOTS.

Under this head only the main medical supply depot in Tokyo, its branch at Osaka, and the medical sections of the Manchuria storehouses require consideration.

Personnel.

Main medical supply depot and branch at Osaka: Main medical supply depot (the number of officers is correct; those of chief nurses, noncommissioned officers of the intendance department, are approximately so; all are based on the results of inspection):

- 9 apothecary officers.
- 2 intendance officers.
- 15 chief nurses.
- 10 noncommissioned, intendance.
- 500 employees, including clerks, laborers, etc.

Total, 536

Osaka branch:

- 4 apothecary officers.
- 1 intendance officer.
- 8 chief nurses.
- 6 noncommissioned, intendance department.
- 50 clerks, laborers, etc.

Total, 69

(The figures for this branch are an estimate based on information received.)

The personnel given is that of this depot and its branch at the time that they were working to their full capacity. As soon as peace was decided upon, as sufficient supplies had been obtained and shipped for the needs of the army for some time under its new status, the personnel was notably decreased.

Principal medical section of the Manchurian storehouse at Dalny:

- 6 medical officers.
- 10 chief nurses.
- 30 nurses.
- 4 instrument repairers.

Total, 50

Medical sections of branches of the Manchurian storehouse at Tieling, Liaoyang, Yingkou, Mukden, Fusan, and Anshantien:

- 11 medical officers.
- 21 chief nurses.
- 63 nurses.
- 11 instrument repairers.

Total, 106

(The figures for the principal medical section are exact; those for the others are a close approximation.)

Supplies.—Nearly all the medical supplies for the army in the field came from the main medical supply depot in Tokyo. They were distributed through the Manchurian storehouse and its branches. Requisitions came from the latter to the former.

The guard of reserve hospitals came from near-by regiments, as far as observed. No estimate can be made of the number of soldiers detailed for such duty. It is known, however, to have been a very small one, as the hospital personnel itself safeguarded almost everything which pertained to it. At the convalescent camps a guard was habitually detailed; this came from the gendarmerie and was also small. Probably not more than 30 officers and 150 soldiers performed such duties for all these camps.

PERCENTAGE OF MEDICAL PERSONNEL IN A JAPANESE DIVISION
IN THE FIELD.

The Japanese official statement of medical personnel employed during the war has already been given. This, so far as medical officers are concerned, accords closely with my figures, some of which were necessarily only estimates. While it would be desirable to analyze carefully percentages of medical personnel to total personnel—for it is on adequate medical personnel, especially medical officers, that the success of any medical department in war must always be mainly dependent—in the absence of any exact figures of the number of troops which Japan mobilized it is not thought worth while to do more than to give the percentage of medical personnel for the Japanese division in the field. It must, of course, be remembered, however, that this percentage by no means represents the total for the division, as each of these organizations required additional medical personnel on the general line of communication in Manchuria, on the hospital ships, and at home.

The total numerical strength of a Japanese division, mobilized, is taken as 19,474. The regulation medical personnel with a division was 1,420, exclusive of company bearers; hired employees are, of course, disregarded. Therefore the percentage of medical personnel to total division personnel, mobilized, with the exception just noted, was 7.3. The total number of officers on duty with the medical department of a division was 117, or a percentage of 0.6+ of total strength of division.

at any time during the war, and were prone to retain this number rather than to decrease it when sick and wounded again diminished, because few new cases were received, and those under treatment were gradually disposed of, yet the demands of the front, on account of the new divisions sent out, and those of the new line of communication hospitals, with a diminishing number of patients at home hospitals and convalescent camps, had naturally resulted in decreasing the personnel at the latter in September, 1905. It was, however, still considerably in excess of the regulation allowance for the number of patients actually present in those institutions at that time.

In making an estimate of the medical and auxiliary personnel present then it will be more convenient and equally correct, so far as results are concerned, to disregard the medical administrative, laboratory, and operative staff, and to take 50,000 patients as the number for which personnel was provided in reserve hospitals, which, for the purpose of this inquiry, will be held to include receiving hospitals. In the convalescent camps the administrative personnel is so comparatively large that it will be included, the results being based on 7,000 patients. The following are the results of this estimate:

At reserve hospitals:

- 1,000 surgeons, including surgeons on probation.
- 375 apothecary officers, including such officers on probation.
- 1,000 chief nurses.
- 10,000 nurses.
- 7,000 employees, such as firemen, cooks, laborers, coolies, etc.
- 25 intendants officers.
- 400 intendants noncommissioned.

Total, 19,800

At convalescent camps:

- 50 surgeons.
- 75 chief nurses.
- 350 nurses.

Total, 475

In reality a much larger number of persons were employed in care of sick and wounded at convalescent camps, as both officer and soldier patients were guests in hotels and boarding houses at such places at the expense of the Government, and the proprietors and servants of these lodging places performed many offices for them.

served to prevent the burial of unidentified dead and the loss of wounded in hospitals. The other form is the certificate of date of last payment. This could not be used with equal ease in armies not having regimental paymasters, but with the Japanese it was quickly forwarded by the regimental intendants officer, so no long delays occurred in the payment of patients in hospital.

SANITATION.

The practice of sanitation in the Japanese army in the recent war has probably attracted as much attention from the world generally as has any other one subject in connection with that excellent organization. A great deal has, therefore, already been written on this theme, but, unfortunately, the majority of writers have apparently only been able to deal in superlatives. Such writers, almost to a man, have clearly been deeply imbued with reverence for "things Japanese," and, while in their enthusiasm they have told some truths, they have allowed themselves to fall into many absurd errors and have made surprising misstatements. To such lengths has this gone that, while they have misled the public, those informed on the conditions under which any army must serve in the field have almost totally discredited them. No greater care has been devoted to ascertaining the facts in the following pages on sanitation than on the other portions of this report, but in view of the importance of the subject, the interest which it has excited, and the general uncertainty as to what has been accomplished, it has been treated in great detail.

There is no doubt but that the Japanese fully appreciated the importance of hygiene as primarily necessary to render their army effective, but, also, while they are perfectly willing to expend lives in fights of the most desperate and sometimes reckless character, they consider the life of each single soldier too valuable to sacrifice it to a disease which is preventable. Popular sentiment, of course, supported this belief, but it did far more. There are no heroes created in Japan from among those who have performed routine duty well, however much such duty may have exposed them to the bullets of the enemy, but the calling of a soldier is held in high esteem, and a man returning to his town or village with

honorable wounds gets the credit which he receives in other countries, though it may be less noisily expressed. Where the difference lies is in the treatment of him who comes home suffering from a preventable disease or a disease so regarded by the public, who are naturally well informed on army matters, as conscription reaches everywhere. This fellow is looked upon as something very much the reverse of heroic, and his family and friends make him quite realize that he had neither been a credit to his country nor to them. It is unnecessary to discuss how powerful a factor this is in making men observe the sanitary instructions given, the correctness of which they would never presume to question. It is understood, moreover, that the army authorities, backed up by popular opinion, exact good sanitation from commanders—in a word, a commander whose force suffers from disease to an extent which is believed unwarranted is likely to be called on for an explanation.

As is stated elsewhere in this report, the roll of deaths and disabilities from preventable diseases in the Japanese army during the Chinese-Japanese war was a long one, so, shortly after the end of that contest, the Japanese went systematically to work, in their usual thorough manner, on plans for the better protection of the health of their soldiers. It is unnecessary, even if it were possible, to trace their progress step by step, so, in order to save time, the part which the medical department plays in the sanitary work of the army will first be stated briefly, and then the selection of the soldier, his training, instruction in sanitation, special diseases, etc., will be taken up seriatim.

The medical department, in the performance of the duties required from it by regulations, of looking after the health of the army and the necessary measures connected therewith, pronounces upon the physical fitness of officers and soldiers entering the army, educates them in sanitary matters, supervises their sanitation during the course of their service, and determines when they are no longer fit for active duty.

All officers and soldiers are carefully examined physically before they are taken into the service; the physical standard maintained is a high one. Officers are required to pass a physical examination on entering on their preparatory course for their commissions, and during the period of their school-

ing are frequently examined, with discharge at any time if their physical condition, as determined by the medical officer, demands such action. In the selection of the soldier the opinion of the medical officer detailed at conscription headquarters to make the required examination is received as final in reference to physical fitness. Available statistics indicate that the percentage of rejections for physical unfitness is not large, and it is probable that as a race the Japanese are well qualified physically for service in the army. The primary examination for men called as conscripts is not held absolutely final, as another is given them after they reach their regiments, where a very few men are rejected. It was very rare in the field to discover a man who was obviously unfit physically for a soldier. In fact, such cases in my experience could be counted on the fingers of both hands. It was rather remarkable to observe how evenly the soldiers ran physically. Naturally some were better than others, but the difference between the best and worst was not wide. A table showing the physical standards adopted for the acceptance of conscripts and the causes for their rejection will be found in an appendix.

It has apparently been fully appreciated by the authorities that any system of sanitation to be successful must rest on a sound basis of instruction for the army personnel generally. This idea has been well expressed by the following Japanese official statement: "Diseases greatly decrease fighting capacity, and medical instruction of officers and men is quite as important as their instruction in combatant duties." The present system of instruction was not the work of a day nor a year, nor has the last word yet been said on the subject, as the lessons of the recent war have been taken to heart, which will result in more thorough methods for the future.

Apparently there was no necessity to create a sentiment among higher commanders in regard to the importance of good hygiene for the army, as such officers have conscientiously supported all practical measures which would lead to the betterment of the health of troops. The necessity of careful hygiene for the army is now thoroughly impressed on all officers from the time they enter the service. Candidates for commissions are given two hours' instruction weekly in physiology during the second half of the second year in

the local military schools. Observation of school rooms, models, apparatus, and conversation with the teachers, who, it should be mentioned, are civilians, indicate that the course is a good one, in that it is complete enough to afford a safe basis for the future study of hygiene. Students who come to the Military School from nonmilitary institutions receive much the same instruction in the latter. During the time that the future officer serves as a soldier he receives the hygienic instruction imparted to other soldiers by their medical officers, and fifteen days out of the year's course of study total, with vacation, at the Military School are devoted to instruction on the sanitation of troops. This instruction is given by a medical officer. When the candidate returns to his regiment for his last service in the ranks, he learns something further from the regimental medical officers. At the Staff College a more advanced course in hygiene is given, extending over about six months.

Soldiers receive their hygienic instruction almost entirely from the medical officers of their regiments, though line officers are said to participate to a slight extent in the teaching. The time spent on such instruction is regulated by the regimental commander, and varies considerably, but is apparently always quite sufficient to inform the soldier what precautions he must take in order to preserve his health. A small pamphlet entitled "Health Memoranda for the Use of Soldiers in Time of War," prepared by the medical department, is issued to troops in the proportion of three or four copies to an infantry company. This pamphlet is used as a basis for the instruction of soldiers, but more dependence is placed on the personal teaching of the surgeon. It is believed that the instruction imparted is of a thoroughly practical character. No attempt is made to represent ideal conditions to soldiers, but what is necessary to insure their good health is well impressed on them, and they are shown that some of the hygienic measures which it would be desirable to take are not always possible in the field, and must under certain circumstances be disregarded, though in so disregarding them they take risks which are only justifiable from necessity, and constitute one of the dangers of war. In the instruction of the soldier an appeal is made to his patriotism. There is little nagging in the

field, the attempt being made to convince troops that, having learned what they must do to preserve their health, cleanliness is only what is expected of every true soldier of Japan. This does not mean, of course, that the attention of soldiers is not called to their occasional violations of sanitary regulations, which is done by both line and medical officers when necessary. Supplementing this instruction, circulars on sanitary subjects are issued from time to time, as required, by the Medical Bureau of the War Department. Their contents are commonly imparted to the troops by their surgeons. The method of instruction of soldiers is practically the same in peace as in war, but the special circulars would, of course, be less likely to be issued in peace.

Physically fit men having been secured for officers and soldiers, careful attention is paid to their physical training and afterwards to keeping them in good condition. These go on coincidentally with their instruction in sanitation. It should be noted that the medical department is not responsible for the forms of exercise, only making recommendations in regard to them when they are considered injurious.

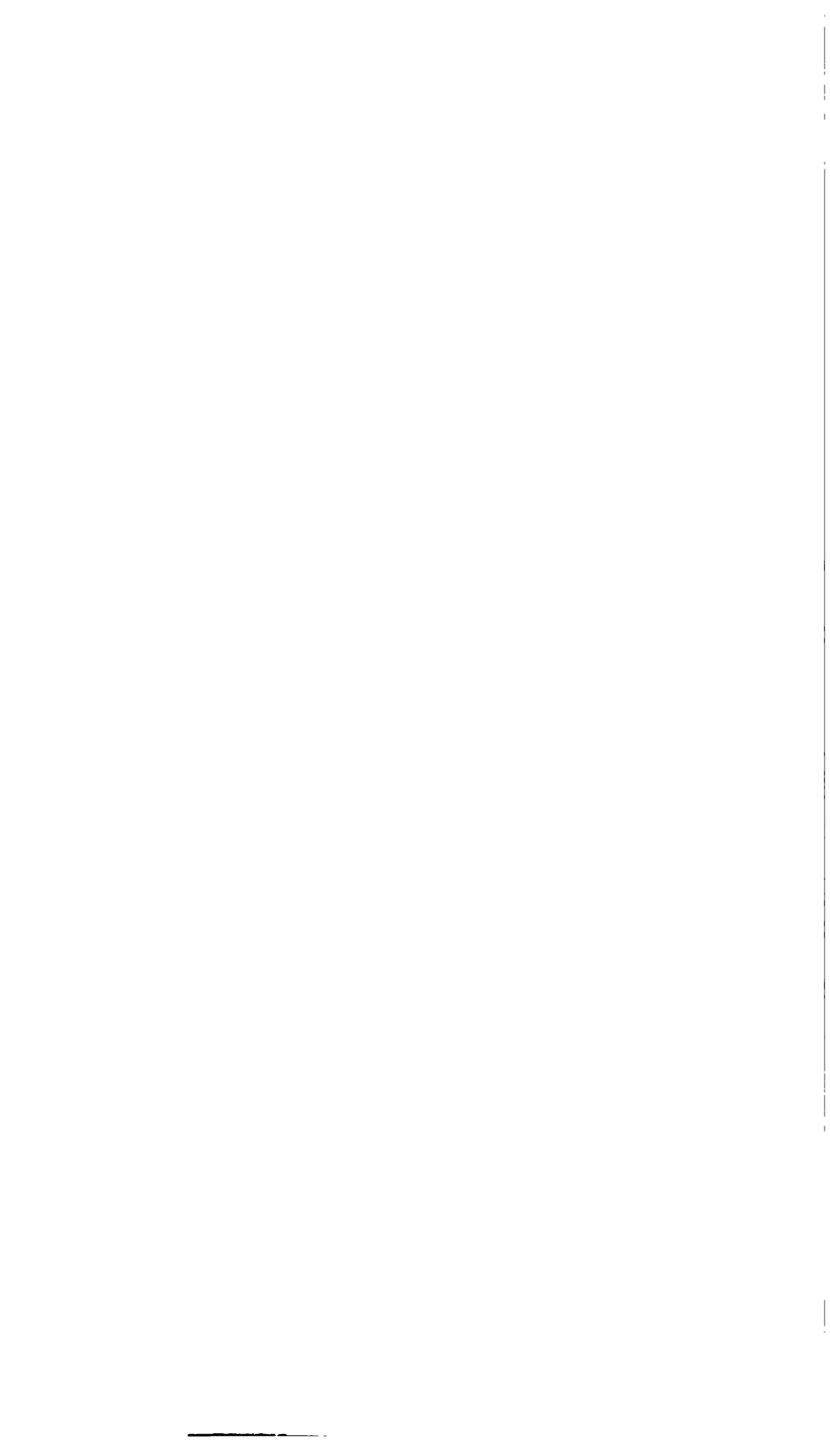
In the lower and preparatory military schools candidates for commissions are required to take certain physical exercises as a part of their course. The popular sports of Japan—wrestling, fencing with the single stick, running, and gymnastics—are all utilized, but not much time is devoted to the last, hardly more than two hours weekly in a poorly-equipped gymnasium in the open air. The physical exercises for future officers while they serve as soldiers are the same as those for other soldiers, which will be described later. In the Military School half of each day is devoted to drill and physical exercises, principally single stick, fencing with the bayonet, and running. The time spent in the open-air gymnasium is about the same as that devoted to it in the lower schools. All the physical exercises are performed with the greatest vigor, and engagements with single stick and bayonet are fiercely contested. Setting-up exercises, modeled on the German system, are also practiced, but neither with them nor in the gymnasium are the more modern methods carried out, and the results attained are not so good as they might be if they were adopted and practiced. However, if the officers turned out lack somewhat in quick-



61. SETTING UP EXERCISES.



62. PHYSICAL TEST OF SOLDIERS IN THE FIELD.





63. CEREMONIAL PRECEDENT TO WRESTLING CONTEST.



advisory, except in their own organizations, where they are executive as well. With regiments and other troops the methods pursued for the correction of sanitary defects is for the regimental or battalion surgeon to notify the commanding officer of them and of the means which, in his opinion, should be taken for their remedy. The presence of epidemic diseases is reported to the division chief surgeon, as well as to the commander. The former is also kept well informed on the health of the regiments by the ten-day reports, and may require more frequent reports if he deems such action necessary. Regimental commanders are also required to investigate in regard to sanitary conditions. In peace they make a formal report to the division commander on the results of their inspection once monthly. This period is reduced to ten days in the field. In campaign, at a prolonged halt, it is customary for the regimental commander to appoint a sanitary committee. The head of this is a medical officer, probably the regimental surgeon, but not necessarily so, and its members are company officers and possibly an intendance officer. One of the duties of this committee is to look after the health of troops, though as that is provided for in other ways its more important function is to supervise the hygiene of the inhabitants of the country. This will be discussed later. Surgeons on duty with troops in the field, as has been stated, are in close contact with the men, and thus are able to make daily, or even more frequent, inspections of quarters, disposal of wastes, water, food, etc.

Frequent sanitary inspections are contemplated by regulations and custom for the chief surgeons of armies and for those of divisions, but in practice the division surgeons do the bulk of this work, and so might properly be styled the sanitary inspectors of the army. If a division surgeon finds sanitary defects in any organization he can not order the commander to correct them, but he can, and invariably does, call the attention of the commander to them and suggests measures for their remedy. Then if they are not corrected the proper order is obtained from the division commander, though this is rarely necessary in practice. Division commanders make a yearly sanitary inspection. While army chief surgeons do not, as stated, make routine sanitary in-

spections, they occasionally make a trip through the army and invariably visit any portion of it where the seriousness of the sanitary situation demands their presence. During the recent war the Chief of the Medical Bureau of the War Department, who was also, as will be remembered, the chief medical officer of the forces in the field, made at least two visits to Manchuria, in which he investigated sanitary, as well as other subjects with which the medical department was concerned. Special sanitary inspectors, some of them civilians of high attainments in their particular specialty, were sent to Manchuria by the Medical Bureau of the War Department in numerous instances in the course of the recent contest.

No system of sanitation for an army in the field can, of course, be effective if account is not taken of the hygiene of the inhabitants of the country in which the army is operating. The Japanese knew this and took measures both to improve general sanitary conditions of the Chinese in Manchuria and for the control of epidemic diseases occurring among them. The Chinese were always encouraged to seek treatment from army medical officers for which, and for medicines, no charge was made. In most of the towns sanitary committees, constituted in the main like the one described above, were organized, though not infrequently the commander of a field hospital was made the head of the committee. Such committees performed practically the duties of boards of health for the towns—inspecting food and habitations, compelling the cleaning of the latter, if necessary, isolating cases of infectious disease, and the like. In some towns troops were employed for a general police of the place, this work being supervised by regimental commanders and, under them, by company commanders. At the same time that this was going on the sanitary committee usually met the natives and arranged methods to prevent the spread of disease, gendarmes making the necessary inspections. The sick were often reported to the military administrator, and thereafter were treated by army medical officers free of charge. The Japanese consider that the gendarmes performed their duties very well, both in reference to the inspection for epidemic diseases and of food supplies. When

infectious diseases were discovered the inhabitants were compelled to close and clean their closets and to disinfect their houses. Lime, sometimes provided by the Japanese, was the only disinfectant used.

In the very large cities somewhat different methods were necessary. Those now to be detailed for Mukden may be taken as the general procedure, though as this city was only occupied by Manchurian Army Headquarters and the necessary guard more work was left to and required of the Chinese than was customary in large towns with big garrisons. When the headquarters of the Manchurian army entered the city of Mukden the attending surgeon attached to it made certain sanitary recommendations to the military administrator. The sanitation of the town was afterwards carried out in accordance with these recommendations and was in charge of the latter officer. On the 14th of March, or within few days after the Japanese entered Mukden, arrangements were made with the Chinese authorities regarding the sanitation of their city, and all their municipal officers were called to the office of the administrator for consultation. One Chinaman was then put in charge of the general police, with 1 assistant and 15 inspectors, to see that the cleaning contemplated was thoroughly carried out. Sixteen Japanese were also detailed as inspectors. The city was divided into 4 sanitary districts, and for a long time after the 15th of March 200 Chinese laborers and 100 carts were employed in policing them. Sanitary instructions for the Chinese were also posted in prominent places. It was not thought wise to press matters in regard to the finding and isolation of cases of contagious disease, as the Chinese objected strongly to soldiers entering their houses. An isolation hospital was provided, but few patients could at first be induced to enter it, so early in the Japanese occupation of the city about 50 Chinese with contagious diseases were turned over to Doctor Christie, who had a hospital at the Presbyterian mission. A register of Chinese physicians was made, and they were directed to report cases and deaths to the Chinese authorities, who in turn would report them to the administrator, but up to the 5th of May this had been a failure, for the first five days of that month only 23 deaths being re-

ported. The administrator then intended to use the gendarmes to make a census and to find the number of cases of contagious diseases. Certain regulations were made for the control of prostitution. These will be spoken of when treating of venereal diseases. It should be noted that in the large district outside the walls of Mukden, where there were many Japanese troops, the usual measures in regard to Chinese sanitation were employed. When suspected cases of cholera were found in the city of Mukden during May, 1905, special inspectors were sent out by the Medical Bureau of the War Department.

The last duty of the medical department to be discussed in this connection is that of the methods for ridding the army of physically unfit material. Disabled officers and soldiers are sent back to the reserve hospital of their division, where disability certificates are prepared under the director. It is customary for both officers and men to return to their troop or reserve troop for discharge, but if the time of a man's active service has expired the certificate of disability is given directly to him. It was apparently found desirable not infrequently to dispose of even officers and soldiers in the active service at the hospitals instead of sending them to their troops. In this case certificates of disability were forwarded to the division commander, who made out the formal order for discharge. With patients to be discharged who will be entitled to pension, a conference committee is appointed by the hospital director, which carefully examines into each such case. In this connection attention should be called to the fact that a monthly physical examination is made by surgeons of all soldiers in the Japanese army. This is not only effective in ridding the army of unfit physical material, but it also operates for the detection of diseases which might be dangerous to the comrades of the sick man and might otherwise be overlooked.

It will now be well to consider general hygienic conditions as they affected the Japanese army. The subjects will be discussed under the following heads: Quarters, their police; the police in their vicinity; transports; clothing and equipment; food; water; disposal of waste; habits of the men; bathing; care of feet; general methods of quarantine and disinfection; disposal of the dead.

Quarters, their police, the police in their vicinity, transports.—The permanent quarters of the army in Japan are generally old and on a poor model, the men occupying rooms in large two-story buildings surrounding a barrack square. This construction came from the French, who have been trying to abandon such barracks for some years. The Japanese would probably do the same thing if it were not for the enormous expense involved. The objections to this form of barracks are so well known that it is unnecessary to go into them here. The size of the barracks naturally varied, but in Tokyo two regiments of infantry were seen occupying those on one barrack square. Many of the Japanese quarters for troops are badly lighted, poorly ventilated, and have insufficient air space. In France it will be remembered that a great deal of the tuberculosis in the army is ascribed to such barracks. This is also the case in Japan, and it is believed that a good part of the great spread of beriberi may be attributed to the overcrowding of such quarters by the mobilization of troops for the recent war. Kitchens for the permanent barracks are separate structures, from which food is brought to the dormitories of the men; this is, of course, another bad feature. The closets are also in separate buildings. The Japanese, with all their indifference to exposure of the body to public view, nearly always, even in the field, when possible, provide individual closets; in the permanent barracks one closet is allowed to about 15 men. Fecal material and urine are received in earthenware vessels, which are emptied by contract for use on the fields. As with closets usually in Japan there is a strong odor in the vicinity—so strong that it would be most offensive to any other than a Japanese. Separate baths, sufficient in number are provided for noncommissioned officers and privates. The other buildings, consisting of a canteen, a tailor shop, a guardhouse, and a room or building for a dispensary, etc., do not require special discussion. The barracks of a division often proved insufficient in capacity for troops mobilized for war, so that numbers of other buildings were also occupied by them. These require no special description. In addition to their frequent overcrowding, their few kitchens often rendered it necessary to carry food long distances. So far as known troops mobilized were never

put into tents, and it is thought that, with all their faults, the barracks and buildings provided proved better for such a purpose than tents would have been.

In Manchuria, as Russian barracks were used habitually for hospitals, the troops were compelled to occupy Chinese houses for the most part. This usually led to the separation of commands in a number of different villages. When possible, before the occupation of any house, it was examined by a surgeon to see if there were any cases of epidemic disease among the Chinese living in it, in which case it was avoided. The Chinese houses were usually very filthy when the inhabitants left them, and when time permitted they were first carefully policed by the soldiers, the walls being brushed down and the interior cleaned, with frequent subsequent papering of the former to give them a neat appearance. Clean mats were put on the khans, and a shelf was made above for the men's clothing and for some of their equipments. Against the khan, on the ground, a shelf was frequently made for shoes, and in the corners gun racks were constructed by winding a heavy rope around a board so as to separate one rifle from another. The dirt floor could not, of course, be changed, but it was kept swept very clean. The men lay on the khan much crowded, each soldier having but about the space which his body occupied. Sometimes it was necessary to place mats directly on the floor for the men's beds, but the khan was always preferred for them, and the number of soldiers in a Chinese house depended usually on the number who could lie on the khans. Khans were sometimes depended upon for heating, but as they smoked usually habashis (braziers) had to be employed. In these charcoal was burned, from which the fumes were exceedingly disagreeable and sometimes dangerous.

A noncommissioned officer was put in charge of each squad in a house, and the food was cooked by each squad independently, the cooking place of the Chinese in the central part of the building being utilized for the kitchen. The large kettles of the company were always set up and used for boiling water. In the yards of the compounds pits for waste water were dug 15 or 20 yards in front of the quarters, which received the water from the cooking and that for washing

clothes. About 15 yards from the quarters a pit was dug for a urinal, and at from 25 to 30 yards, if the size of the compound permitted so great a distance, other pits were made for closets. These were screened by matting; ashes and dry earth were used to cover dejections. While this was the usual type of quarters for troops in the field the half-underground Russian barracks, which the Japanese considered unfit for hospitals, were occasionally employed, and on the front line quarters were constructed in the trenches. The police of quarters and their vicinity was good, both in Japan and in Manchuria. At home coolies did little but the dirty work in connection with the removal of fecal material and the like, but in the field they were used more largely, being not infrequently employed for the preliminary thorough cleaning of quarters, and afterwards for emptying the closets, cess-pits, etc. Coolies were commonly found who were glad to do this work for the rejected food of the soldiers. The army was never compelled to resort to tents in Manchuria.

The vessels taken by the Japanese for transporting their army by sea were subsidized ships, of which they support many. As these ships varied in size between the 6,000 tons European liner to small vessels on coasting service in peace, they differed considerably in suitability for carrying troops. None was seen, however, which was not fairly well adapted for this purpose. These vessels being subsidized, are immediately available on the outbreak of war. Most of them are then sent to Ujina, where they receive their fittings. These are stored at the Ujina workshops, where skilled workmen are able to adapt a ship for a special purpose in a few hours. This is quite necessary, as, with the Japanese, such vessels may on one trip carry troops, the next, horses, and the next, cargo exclusively. While these vessels were often crowded with men, to an extent which would have been dangerous for a long journey, no appreciable amount of sickness is thought to have resulted from this condition of things on the short trip from Japan to Manchuria.

Clothing and equipment.—The sources of the clothing and equipment of the Japanese army have already been given. Great improvements were made in the quality of clothing during the course of the war, and it will now compare favor-

ably with that of other armies. At the outbreak of the war the Japanese still placed their main reliance for field service on the old blue uniform, but the color of this proved objectionable, and a cotton khaki was soon furnished. No woolen khaki was issued until about the end of the war. The Japanese soldier in the time of peace is not pampered in regard to clothing more than in other respects. In barracks he has a bed, in which a straw mattress is laid on wooden slats, and one blanket. On going into the field he takes everything with him on his back or mount, except this bed and mattress and a small box, used for articles of private ownership. In barracks these boxes rest on a shelf on the wall above the men's beds.

Summer uniform used in the field.—The underclothing of the summer uniform consisted of light cotton shirts and drawers, white in color, and of heelless cotton socks. Each man also wore an abdominal bandage, made of a long piece of Canton flannel, which encircled his body twice and was held in place by tapes or pins. When wearing kimono the Japanese always use a suspensory or jock strap, put on like a T bandage, and a great many soldiers wore this, though it was not furnished by the government. The outer clothing in summer was made of a khaki cotton of good quality, but somewhat lighter weight than ours. The blouse had a strap of the same material on the left side, which buckled above to form a loop, through which the cartridge belt passed. The object of this was somewhat to relieve the waist from the heavy weight of the belt. All the trousers were short and were held together by lacings at the bottom. Two types of legging were provided, one much like that issued in the United States Army, except that it buttoned instead of being laced, and the other a woolen bandage puttee; the latter was generally preferred. The old-style flat blue cap, so soft that the crown rested directly upon the head, was the only head gear used by men during the war. This had a small visor. The havelock was worn during the summer. Two types of shoes were furnished, one low and the other an ordinary high shoe with bellows tongue. The latter was a fair, though rough, shoe, but the former was probably the worst foot gear that any army has attempted to wear in a



64. JAPANESE INFANTRY SOLDIERS WITH HEAD NETS. NOTICE THE RUSSIAN BOOTS WORN BY THE MAN ON THE RIGHT.

great many years. In fact, it was only because of the cast-iron character of the foot of the Japanese soldier that he was able to march in it. It was stated at the clothing depot that no more such shoes would be issued. The leather for shoes comes partly from Japan and partly from America. All shoes have hob nails in the soles and heel and toe plates. The cavalry has a boot, which is not particularly good, and both mounted and unmounted troops seemed to like the Russian boot, which they wore no matter if, as was usually the case, it was 2 inches too long for them. With the summer uniform a mosquito net is issued to each soldier. This is a circular head net, which collapses and may be carried tied to the belt. The mesh of the net is so fine that it is difficult for a man to breathe through it.

Winter uniform in the field.—The Japanese, having had previous experience with the rigors of the Manchurian climate in winter, outfitted their soldiers for it as well as might be with the materials at hand and with those they could purchase. The winter underclothing consisted of a suit of coarse cotton crepe over which was worn a heavy ribbed shirt or sweater and slightly lighter drawers of the same material. The socks were woolen and heelless. The Japanese claim that these socks are excellent, as they conform well to the shape of the feet and do not wrinkle. The same abdominal bandage is worn in winter as in summer, as is also the suspensory. Heavy blue blouses and trousers constituted the uniform proper. These were warm but of shoddy material. The blue uniform also had the loop for the cartridge belt. Over this the cotton khaki uniform was frequently worn. A sleeveless vest of sheepskin, fur worn inside, was put on over the blouse in severe weather. Such vests proved warm and comfortable. Under the blue cap a knitted woolen hood was put on. This hood could be drawn over the head and down on to the neck, so that only the face was exposed. The shoes and leggings were those described for summer, but the cavalry and some foot troops used another boot with a light leather sole and a quilted felt top. Many of the soldiers also made themselves straw shoes, and others wore the Chinese felt shoes, often packing them with a certain grass, as do the Chinese. This last class of foot gear proved very

effective in preventing frostbite. The straw shoes were better than the leather ones for this purpose, and the Japanese state that they did not notice much difference between the high and low leather shoes. The khaki-colored overcoat was an excellent one, though it was made of shoddy material. It was large and loose, with long sleeves, which could be turned down to protect the hands. Its best feature, however, was a high fur collar, which prevented the heat of the body escaping at the neck and rendered this rather light garment an extremely warm one. A hood of the same material as the coat was also provided. This had long ends, which could be wrapped about the neck. Knitted woolen gloves were worn, over which were put lightly lined mittens of the same material as the coat. These mittens were joined together by a string which passed through loops on the coat, so that they might be cast aside in managing the rifle and would not be lost. It was intended that only one blanket be provided for the soldier either in winter or summer, but a patriotic society supplied an extra blanket, which was really badly needed, as the blankets are thin and of light weight. The blanket first issued was red in color, but this proved so conspicuous that later a khaki-colored blanket was furnished, which was of slightly better material and heavier in quality.

New uniform.—Though some changes have been made in articles furnished for the new uniform, the principal alteration effected in it has been by the employment of better materials. It was inspected in the clothing depot at Tokyo in September, 1905. The Japanese have now apparently decided to rely entirely on khaki-colored uniform—cotton for summer and woolen for winter. The latter has no green shade. Though the uniform for officers is not issued at the depot, models of it are kept there for the information of civilian tailors and outfitters. As it is considerably more conspicuous than their old one, it is presumed that the Japanese found it desirable to so mark officers that their men could easily distinguish them in the field, and that Russian marksmanship was not good enough to make this unnecessarily dangerous to the officers. Their new cap, which is quite the German officer's cap in shape, has a red band. The insignia of rank have been removed from the sleeves, and

shoulder straps are worn. The material for the uniform is good throughout, as is also the workmanship. It possesses no features of interest to the sanitarian other than those of the soldier's uniform. The new woolen khaki blouse for soldiers is excellent, both as to material and workmanship, as are also the trousers, which are all short. Two overcoats are furnished, one much like the old one, except that the cloth of which it is made is good and the goatskin collar is detachable, and the other of cotton khaki blanket lined, with layers of paper interposed between cotton and lining. Both are good garments. The goatskin waistcoat is retained, as are also the cloth hood, the knitted hood, the balbriggan underwear, the one-fingered mittens, the heelless socks, the crepe and cotton underwear, and the bandage puttees. Felt toe-caps have been added, and felt boots and long and short leather boots are now supplied, as well as the high calfskin shoe. While some improvements have been made in the foot-gear, it is still the worst part of the Japanese uniform.

Equipment.—There are but two or three articles in the personal equipment of the Japanese soldier which are peculiar and require description. The knapsack has a wooden frame covered with calfskin, hair outside. It is about 12 inches long, 8 wide, and $3\frac{1}{2}$ deep. A rear flap turns down, exposing the whole interior. The knapsack has two straps, one on each side, leading from the top and going around to buckle at the bottom, thus making the shoulder loops and two other straps in front, with hooks which go under the belt. A small aluminum water bottle is furnished. This holds but little over a pint. At the beginning of the war it was simply blackened on the outside, but afterwards a khaki-colored cover was made for it. The special advantage which the original water bottle possessed was that it could be put in the fire, and thus afforded a means for the sterilization of water even during a battle. As the new type of water bottle was not issued until after the battle of Mukden, no practical test was made of it under battle conditions, but it is presumed that, despite the necessary destruction of the covering, it would have been used for boiling water. Each soldier carries an aluminum boiler for rice, which is also used as a ration can. Like the water bottle, the color of this was

changed from black to khaki color. While all articles of the Japanese clothing and equipment, aside from the shoes, were well adapted for their purpose, none deserves special commendation except the fur collar for the overcoat and the fur waistcoat. Allusion has just been made to certain advantages possessed by a water bottle in which water can be boiled.

Method of carrying clothing and equipment.—The infantry soldier, who may be taken as the type for all dismounted men, carries, in full marching order, the knapsack, with the overcoat made into a roll placed over its top, with the shelter tent and poles. Sometimes the blanket is also put here. Knapsacks examined contained two days' rations of dry rice, six packets: one day's ration of rice; eight packets of biscuits, or rations for one day and one-third; one triangular bandage, 30 cartridges in clips, a small cloth bag holding tools and parts for repairing the rifle, three pairs of socks, two cotton and one woolen; a small pouch for needles, thread, comb, etc.; a tin box of grease for shoes; a tin box containing camphorated lard to prevent chapping, and one can of corned beef to each three men. The dismounted soldier has his water bottle hung by the right side on the hip, under which is a small haversack, which contains a few private articles. Cartridges, in addition to those in the knapsack, are in leather boxes, two, each containing 30, being attached to the belt in front, one with 60 being placed behind. All infantrymen have the rifle, and a certain proportion of them an intrenching spade or pick. It is not intended that the blanket be carried in march, but in practice men frequently retained it. The experience of the war showed that a burlap bag was necessary to contain earth, and this was added to the equipment, being placed on top of the knapsack with the other articles and being held in place there with them by the straps of the knapsack. With the full equipment for both summer and winter an extra pair of shoes was carried, and in the winter a wicker bento box was added, the latter on the top of the knapsack and the former at its back.

For an attack the equipment was considerably cut down, the knapsack being replaced by a long cloth shoulder roll.

containing two days' rice and biscuits and many cartridges. This was worn over the right shoulder, with the overcoat in a roll over the left. The burlap bag was also carried in a roll as a part of this equipment. The weight of the knapsack was found to be 28 pounds and that of the gun 10; the cartridges in the boxes may be estimated at 6 and the other things at 9, making a total of 53 pounds, without blanket, in full marching order. It is estimated that this weight was cut down about 20 pounds in the equipment for the attack. It should be remembered that a great number of extra cartridges were then placed in the roll. A great many foot soldiers carried their full equipment, even in attacks, during the battle of Mukden, and the Japanese officers did not seriously attempt to prevent this, only requiring these men to keep up with their more lightly burdened companions.

The Japanese intend that the mounted man shall be self-sustaining equally as long as the foot soldier; the former, therefore, carries very similar equipment. He has his great-coat on the cantle, with the shelter tent rolled in it, the haversack and water bottle on the saddle, two days' emergency rations, an extra suit of underwear, a pair of socks, and the bento box in the saddle bags, two blankets under the saddle, currycomb, brush, and spare shoes in the wallet, and a double rope halter. Seventy-five rounds of ammunition are carried, 30 in the pouch and 45 in the wallet. It will be noticed that the cavalry are heavily laden. The experience of the Russo-Japanese war only goes to show again that the clothing and equipments of an army must contain no articles except those of a dull khaki color, and that red blankets, black water bottles, bright swords, etc., attract fire and are a source of unnecessary danger on the modern battlefield.

Food.—The field ration table of the Japanese army is given in the appendix on sanitation. Though followed strictly enough usually, foods not supplied under it were occasionally issued; for example, pears were noticed being sent to the troops in Sakhalin from the food depot in Tokyo in September, 1905. As may be seen in the table, according to our standards the vegetable components are in considerable excess, whereas the amount of meat is small. Rice, according to the dietetic customs of the Japanese, was

always the staple article. Cigarettes are practically always issued as a part of the ration, but so far as observed "sake" was only supplied men at times of extra hard service. The cost of the ration is fixed at 21 sen per day for noncommissioned officers and privates, 24 for officers, except those of the rank of general, who receive 33 sen daily. These amounts were each increased 3 sen per day by an Imperial ordinance published in March, 1904. Under certain circumstances money for buying food may be furnished in lieu of the ration in kind. When this is done for soldiers, a sergeant is usually given by an intendants officer the amount necessary to pay for the food of 50 men for four days. This practice could only rarely have been resorted to in Manchuria, but hospitals bought a good many articles of food there. While it would have been possible for the troops to have lived on the country there partially, the Japanese desired that all money should be expended in Japan, and in consequence made nearly all their purchases of food at home. Rice was always bought there, both for this reason and because the Japanese thought that Chinese rice was not of good quality. The rice was generally substituted in part by barley, as it was believed that this would lessen the amount of beriberi. In the summer of 1905 two "go" of barley were being issued with four "go" of rice, but the relative proportions of these different grains were not always the same.

As previously stated, the intendants department is in charge of supplying food for the army, their main depot being in Tokyo. This depot prepares some food and also makes large purchases, distributing them all over Japan. The depot itself is a model institution, not that any great amount of food is prepared there, but as an experimental station where the rations of different countries are studied. various foods are examined as to their nutritive value, and trial is made of the different methods of preparing food for field use. At the time of inspection, in October, 1905, only two articles were being prepared, shoyu and canned beef. The former is a sauce extracted from beans or peas. The entire process for the preparation of the canned beef is performed at the depot, from the killing of the cattle till the beef is ready for issue in cans, boxed.

Both cans and boxes are also manufactured on the ground. Some of the tinned beef seen in the field had sugar mixed with it, which rendered it extremely disagreeable to the taste of the ordinary American or European, but the canned beef prepared at the end of the war contained no sugar and was a palatable article. In making this beef none of the nutritive properties are lost, the extracted juice being included in the cans. Little beef on the hoof was issued in the field.

A constant and successful effort was made to supply men on outpost or other advance duty with a better ration than their comrades who were not equally exposed to hardship. It was noticed that no great pains were taken to account for rations, the object being, on the contrary, to supply each soldier with all food which he desired to eat. This was the case even in the field hospitals during a battle, in which soldiers generally, aside from the personnel and patients, were usually able to obtain something to eat. Provision was made for furnishing food to men passing through stations on the lines of communication, who were only required to appeal to the military administrator or the station commander in order that they might receive an order for food. At the larger stations special provision was made for kitchens devoted to furnishing transients with cooked food, and at the smaller ones they reported at a designated organization. During a battle it was impossible for division trains carrying the food supply to get near the firing line during the daytime, so then they moved as far to the front as was possible, stopping usually in the shelter of the walls of a village. When night came and the firing ceased wholly or in part, food was rushed forward to the troops in contact with the enemy. Individual preparation of food was seldom resorted to by the Japanese soldiers, rice, the staple, being commonly prepared in the iron kettles carried on packs with battalion transportation. As has already been noted, the Japanese soldier carries an emergency ration in his knapsack, but in practice it was not often necessary to resort to this. Each soldier, by regulations, is required to carry personally two days' rations. One day's rations are transported in the heavy baggage and four days'

in the provision column. Train soldiers carry three days' rations, two personally and one in heavy baggage.

The standard established for the soldier's daily allowance of food was a minimum of 2,580 calories. In the Second Army food was analyzed four times monthly by weighing the different components of a number of rations as served, and the number of calories was estimated from a table. If less calories were found than the minimum standard, the medical department, which made the examination, notified the intendants department that an increase in the amount of food was necessary. One of the most important duties of the Japanese medical department, so far as sanitation is concerned, is careful examination of the food supplied troops. Not only is the food issued inspected, but also that to be placed on sale at the canteens. Consequently soldiers can not procure injurious articles of food in them.

On account of the widespread belief that beriberi is due to dietetic causes, investigation as to the sufficiency of food supplied the Japanese army and also the kind of rice furnished it is of extreme interest. It may safely be stated that at all times the Japanese soldiers in the field were supplied with food as great or greater in amount and of a better character than that they received at home. The quality of the rice was also that to which they had been accustomed. The statement has been made that in some of the armies far from the railroad the meat components of the ration were very much diminished during the summer of 1905 on account of the difficulty of procuring this class of food, but it appears probable that all soldiers received a larger amount of proteids than they do at home.

The dietetic habits of the Japanese as a race are so different from ours that, so far as the articles which constituted their ration are concerned, no suggestions are offered us by their experience in the recent war. In the war, in the issue of food, careful bookkeeping methods, in accounting for each ration, were subordinated with benefit to adequate supply of the army. This, of course, is but one instance of the general policy of the Japanese in regard to like matters. Their careful study, with analysis of food purchased and manufactured, was valuable, as was also their field examina-

tion as to the sufficiency of the food supplied. The control which the medical authorities exercised over foods sold by canteens requires commendation. Pack-animal transportation, immediately in rear of battalions, enabled men to have their cooking outfits with them at all times. Their arrangements in this particular proved superior to the Russian soup carts, which, though undoubtedly valuable with an advancing army, were so unwieldy that hundreds of them were necessarily abandoned by Russian forces in retreat.

Water.—The previous experience of the Japanese and their study of the mortality and morbidity statistics of other armies convinced them of the necessity of providing a safe water for their troops under all circumstances. As will be seen in the Health Memoranda for the Protection of the Health of Soldiers, the necessity for drinking good water is emphasized. Nearly all water used by the troops was sterilized by one method or another, but the Japanese authorities state that in some instances they allowed men to drink unprepared water from bubbling springs. That much such water was procurable during the course of the war is improbable. There were, of course, some individual instances of men drinking water from streams and other unauthorized sources, but, as a rule, Japanese soldiers were very careful to use no untreated water. Naturally, sometimes in the course of a battle thirst almost drove them to use any water which they encountered, but even in battle—that is, in the battle of Mukden—it was quite remarkable how many men drank only sterilized water or tea. Men of the train, who as a rule are not as well disciplined as fighting troops, were somewhat more careless in taking water from streams than the latter. They undoubtedly suffered more from the water-borne diseases than the fighting troops, and the Japanese ascribe their more frequent infection to the above-named cause. This does not mean that there was any widespread disregard of the sanitary instructions in reference to the use of water even by train soldiers, as a matter of fact, they did very well in obeying sanitary restrictions in regard to this.

Great pains were taken at all times to analyze water for troops, but such analysis was not allowed to exempt troops

from sterilizing their water. The analysis was, in fact, merely intended as a means for the selection of the best water supply available. The statement has been made that scouts were accompanied by surgeons, in order that the latter might examine the water encountered, so that after-coming troops might be protected. This is untrue, and, as a matter of fact, the water was, in practice, first analyzed in the field hospitals, which all carry reagents for its chemical examination. Japanese surgeons have made the assertion that one of the sanitary soldiers in each battalion carries in his knapsack three bottles and some test tubes for a simple chemical examination of water. One of these bottles is said to contain Nessler's reagent, the second an iodinated solution of starch, and the third a dilute solution of sulphuric acid. Careful examination of the knapsacks of a good number of sanitary soldiers failed to discover any such apparatus. Routine examinations of water were made four times monthly in field hospitals, and when a village was garrisoned by troops all available water was promptly examined. The best wells were then selected, and were built up in one or another manner so as to prevent surface drainage into them. A few driven wells were put down by the army, but it is believed these rarely proved a success. A guard was stationed at the selected well or wells, who prevented the Chinese and soldiers from doing anything in its vicinity which would be likely to infect it, and men were directed to take water from no other well. During a battle it was, of course, impracticable for any selection of water to be made, so men then generally depended on the most convenient supply.

Boiling was the method of sterilization relied upon, to the exclusion of all others, whenever it was applicable. In battle, the vast majority of soldiers used their individual water bottles for this purpose. A great many men were questioned through interpreters in reference to the time water should be boiled in their canteens and the like, and they were universally found well informed on the subject. In a halt of any duration, the battalion kettles, and later in the war the water carts, to be described in a moment, were in almost constant use for boiling water. If water was found to be very bad on analysis it was frequently boiled twice. At important towns on the lines of communication, public boiling stations were



65. METHOD USED TO BUILD UP CHINESE WELLS SO AS TO PREVENT SURFACE WASHINGS INTO THEM.



established, where Chinese worked night and day, so that any comer might obtain good water on application. At each village through which troops passed, little stations for boiling water and supplying tea were also opened, so that men en route from one point to another would have no excuse for using bad water, based on the argument that they were unable to obtain a good supply. This last was an excellent idea, and, as the men preferred tea to water, they were very prone to only assuage their thirst at such stations, or from their canteens with tea obtained at the stations. Fortunately for the Japanese, too, their soldiers do not object to drinking hot water.

The Japanese had evidently made some experiments before the war on the chemical sterilization of water. It was stated that it was intended that regiments should carry two solutions for the chemical purification of very bad water. These were probably on hand in some instances, though they were seldom resorted to in practice. Alum and ferric chloride were used, and with either sodium carbonate was employed in solution for about twenty minutes after the first solution was thoroughly mixed with the water. It was intended that the impermeable water baskets of the troops be used in making this purification. The field hospitals had another method of chemical sterilization, though it was impossible to discover whether they ever practiced it. For this, tablets of calcium chlorate and sodium sulphate were provided, and a solution of hydrochloric acid. The calcium chlorate tablet and the acid were first added to the water and then the latter tablet to neutralize the chlorine. It is safe to conclude that the results attained by these methods of chemical sterilization were not satisfactory, as the Japanese had practically abandoned them at the end of the war.

So far as known, there were but two methods of chemical sterilization in use at this time. The first of these was recognized in orders and was intended to be used, either when time was not available for boiling, or conditions were such that boiling could not be practiced. The special apparatus for it was called the Ishiji filter, from the name of its maker. The process was held secret. This filter is described at length in an appendix. While the experiments which the Japanese made to test it, as described in a translation, do not seem con-

clusive, it is said to have had the approval of Professor Kitasato, whose name carries the greatest possible weight. A further report will be made on this apparatus as soon as some experiments now under way are completed. The model for the second apparatus had apparently been suggested by one of the Japanese surgeons, but it had not been officially adopted. It consisted of a canvas cylinder mounted on a bamboo tripod, and sterilization of water in it depended on precipitation by alum.

During the summer of 1904 no regular type of water cart was issued to troops, but their needs in this direction were not disregarded for the following year. It will be remembered that Manchuria is very hot in the summer, that the marches made by the Japanese army during 1904 were sometimes long, and that the individual water bottles of the men are small in capacity. As far as can be learned, some troops improvised water carts the first summer, and they also had impermeable water baskets, but these containers were not found sufficient. Therefore, early in 1905, the great arsenal in Tokyo undertook the manufacture of a special type of water cart. This consisted of a boiler mounted on the ordinary Japanese cart. A picture of this is shown and a drawing of its interior construction. The capacity of the boiler is about 60 liters, and the officer in charge of the Tokyo arsenal stated that he had manufactured sufficient carts to allow the issue of two per company.

The principle which the Japanese established that all drinking water for their army should be sterilized is undoubtedly a correct one. Their careful analysis of water generally, while of some value for selecting the best water supplies available, did not compare with this in importance. Details in regard to supplying sterilized water to men at all times were carried out well. It must be recognized, of course, that if men can not get good water they will use any water at hand. If the Ishiji filter prove efficient, the Japanese will have found a valuable apparatus for water sterilization, which can be used under circumstances which do not permit boiling. With the Japanese, as with all other armies, the greatest difficulties were experienced in furnishing men with safe water during battles. Boiling in the individual canteens of the soldiers at such times unquestionably



66. ISHIJI FILTER IN USE IN THE FIELD.



67. REGULATION COMBINED BOILER AND WATER CART.

prevented a large amount of water-borne disease. The experience of the Japanese with water carts is only that of every army which has engaged in war. Their plan of having these carts capable of furnishing sterilized water should be followed, though it is, of course, possible that better methods for making safe, water supplied from such carts are available.

Disposal of wastes.—Reference has already been made to the subject of disposal of wastes under "Quarters." Little need be added to this. At home, in barracks, the excreta and urine of Japanese soldiers are received in closed earthenware vessels, which are emptied by contract for fertilization of the fields. In Manchuria when the army occupied quarters they promptly dug pits in their near vicinity, which were screened, but often not sufficiently so to exclude flies, which constitute a terrible pest there during the summer. Ashes and earth evacuated in digging pits were both used to cover their contents, and this was fairly well done. The Chinese are extremely filthy in regard to both defecation and urination, using the sides of the streets for those purposes. In the larger cities, such as Mukden, the Japanese compelled them to erect public closets, and this did away with the terrible nuisance to a considerable extent. On reaching a small town, the Japanese had the deposits of filth cleaned from the streets, but it was apparently never possible to make the Chinese keep them clean, and human feces were always found in them. During a battle, the Japanese did not attempt to dig pits, and the soldiers defecated and urinated at will at every halting place and in every village. If the Japanese occupied such a village afterwards, it was thoroughly policed, as stated above.

Habits of the men, bathing, care of feet.—The habits of the men were good. Japanese soldiers are not, contrary to popular belief, total abstainers from alcohol. In fact, they drink a good deal of their national beverage "sake," which was usually easily obtainable from the canteens or sutlers' stores. Notwithstanding this, a drunken Japanese soldier was very rarely seen. Venereal disease is not uncommon in China, but the excellent discipline of the Japanese soldiers prevented them from cohabiting with Chinese prostitutes, except those that were regularly licensed under much the same plan that is pursued throughout Japan. The hab-

its of the men in regard to personal cleanliness are excellent. All bathe very frequently, even in the field, taking great pains to improvise apparatus for heating water. The temperature of the baths is always very high, as is the custom generally in Japan, and many men use the same water for bathing. It is remarkable that the Japanese infantry was not largely incapacitated from marching by sore feet, on account of their very bad shoes, but this was not the case. As has been stated, this result can only be ascribed to the ability of the Japanese foot to resist injury. It will be remembered that the Japanese as a race go barefooted, and that in consequence their feet become very hard. Special attention is drawn to the necessity for careful attention to the feet in the health memoranda for soldiers, and the infantry as a rule take good care of the feet after a march. While foot soreness was not apparently particularly common, the Japanese surgeons were not satisfied that everything possible had been accomplished to prevent this, so, besides the better shoe, more attention will be enjoined on the soldiers in caring for their feet. It has been claimed by some observers that the Japanese infantry did not march far enough to test their feet, but this is believed to be untrue, as while the advance of the army was slow, troops marched considerable distances within their lines and made long tactical moves during the battles.

General methods of quarantine and disinfection.—Japan has very strict laws to prevent the spread of epidemic diseases, so that soldiers entering the army encounter no more rigorous rules than those to which they are accustomed at home. Both quarantine and disinfection are carried out thoroughly in the army, and much intelligence is displayed in the administration of the regulations in regard to them. Special attention is invited to the regulations for the establishment of military quarantine stations. In the Chinese-Japanese war returning troops brought a great deal of epidemic disease to Japan, where the population generally was infected. The Japanese determined to prevent this in the recent war by the establishment of these quarantine stations, which were entirely administered by the army, having nothing to do with the ordinary quarantine service of Japan, which is under the Home Department. The quarantine sta-

tions had all facilities necessary for disinfecting ships, clothing, etc., for the bathing of persons arriving, the quarantine of certain cases, the isolation of contacts, ample hospital accommodations, etc. Personal experience at Niroshima showed that it was well administered. When persons passing through it were believed to be likely to carry epidemic diseases, their effects were disinfected with a good deal of care, and inspection of all arrivals was always thorough enough to detect contagious diseases, if this were possible, at the time, but the disinfection of the clothing of persons probably not infected was rather slighted. It is not thought, however, that the clothing so passed could have become a source of infection to the inhabitants of Japan after being landed, but the rather inefficient methods adopted for it would have been likely to have led an observer not familiar with the better methods pursued when infection was believed to exist, to conclude that, while all apparatus necessary for thorough disinfection was at hand, it was not used in the proper manner. Plague, cholera, and yellow fever were the diseases quarantined, the first for ten days and the last two for five. While, so far as known, no cases of any of these diseases were brought to the quarantine stations during the war, if they had been, the ships on which they came and all articles on them with which they might have come in contact would, of course, have been disinfected. Typhus fever, scarlet fever, diphtheria, and measles cases were quarantined, and the transports which carried them were disinfected, but healthy soldiers on such ships were not detained in quarantine. Transports carrying dysentery or typhoid were disinfected, but such cases usually went to the contagious disease hospital in Hiroshima. Some Russian prisoners of war with these diseases were, however, treated at Niroshima.

Everywhere in the Japanese service, including the field, great care was taken to discover cases of contagious disease early, to disinfect articles, houses, etc., with which they had come in contact, and to isolate patients suffering from them. The Japanese included typhoid fever and dysentery in this class of diseases. The Chinese suffering from such diseases were not always removed from their houses, however, but these were avoided by troops and were disinfected. Even in Sheibyoin (immobilized field hospitals), separate build-

ings were set apart for contagious diseases. Here suspects, actual cases, and convalescents of each such disease were quartered separately. All houses used as hospitals for such cases were screened, mats were placed on the floors before the doors and were kept constantly saturated with carbolic acid solution, and an antiseptic solution was provided at each doorway, where physicians and attendants were required to wash their hands. Separate dishes were used for patients suffering from these diseases, and, when dishes were not actually in use, they were always covered so as to prevent flies having access to them. Special bedpans and urinals containing disinfectants were also furnished. After the contents had remained in them for about half an hour, they were burned or boiled and then buried at a special place. When diseases of this class were found in an organization, the quarters were carefully disinfected, and all articles were given at least a thorough exposure to the sun and, when possible, disinfection by steam in the regular apparatus. The Japanese intended to do little transportation of patients afflicted by these diseases, only desiring to send them to the isolation section of an immobilized field hospital, but, when a field hospital was likely to be required to advance with its division, it was cleared of such patients, who were sent as far to the rear as circumstances required, care being always taken not to move them unnecessarily but only as required to gain beds for other patients. Railway cars used for this purpose were always labeled and were disinfected before being employed for other uses. At hospitals on the lines of communication, at those at home, and on hospital ships the same precautions were taken. They could hardly have been more elaborately carried out than they were at the field hospitals at the front.

The attention to detail, which the Japanese displayed in measures to prevent the spread of contagious diseases, was one of the points most deserving of praise in their medical service. It is believed that they were very wise, too, in including typhoid fever and dysentery among such diseases. While these affections may not spread from person to person to a large extent in a civilian population, in an army conditions of life are so different that water carriage plays a

comparatively small part in their dissemination. The disinfectants which the Japanese used may be found in the appendix on sanitation. As will be seen, they employed no new ones. The prompt discovery of cases of contagious disease in the Japanese army was noteworthy, however, and it is believed that their experience has more clearly proved the necessity for this and for immediate removal of infected from well men than have any previous observations.

Disposal of the dead.—The special regulations governing disposal of dead in the field may be found in a special appendix. In Manchuria men were detailed for this task from the organizations which had been engaged, or, if these had advanced, the gendarmerie was employed. Chinese coolies were also hired for this work to some extent when there were many bodies to be cared for, though the Japanese did not seem to care to employ them if this could be avoided. As far as observed, a senior noncommissioned officer was always put in charge. Great pains were taken to identify each Japanese soldier, so that when time permitted a number of hours were occupied in disposing of bodies. The men's personal effects were also collected with much care. All Japanese were cremated. In the field a pyre was built of wood, on which bodies were placed; this was then set on fire after being saturated with kerosene oil, which was afterwards freely poured on as required. A crematory was in use at Dalny. The Russian dead were buried by a detachment constituted like the one just described. Their bodies were placed, when possible, in a trench, and the dirt which had been excavated from it was shoveled back on them. As the large Manchurian dogs were able to dig into the ground to a considerable depth, they sometimes disinterred and ate Russian dead.

Personnel of the Japanese army in reference to racial characteristics conferring immunity from disease.—Before discussing special diseases, a word must be devoted to the racial characteristics of the Japanese in reference to disease and to the healthfulness of the country in which the army operated. It is not believed that the Japanese soldiers possessed any special immunity to the diseases which they were likely to encounter in the course of the war. No more can be said of

them than that they were a sturdy body of men, inured to a good deal of hardship by the conditions under which they live normally, and that their high order of discipline and the education on sanitary subjects which they had received helped them from becoming infected by prevalent diseases.

It is interesting to note that practically one-tenth of all casualties occurred among train troops and far more than one-tenth of the total casualties from disease, as their losses from wounds were very few in number. While such troops were not as well taught or disciplined as other soldiers, and therefore were less careful in their hygiene, it would not be just to ascribe their comparatively high mortality rate wholly to their errors in sanitation, though this was undoubtedly the important factor in the result; but it should also be remembered that they were not so good physically as other troops and their work was much harder. The intelligent one-year conscripts, on the other hand, had least disease.

Manchuria, in reference to health conditions.—Manchuria has been described both as an ideal health resort and also as one of the most dangerous places for large bodies of troops to occupy. It was, in fact, neither the one nor the other. The death rate of the population of a country can hardly be taken as a measure of the healthfulness of that country for troops; personal observation indicates that the death rate is rather high in Manchuria, many children dying, as would naturally be expected under the conditions of life among the Chinese, but more important is the question as to whether diseases are present there which might affect an invading army. Many such diseases are undoubtedly found among the inhabitants, and sickness was rife at Mukden in the 50,000 Chinese refugees, who lived in the greatest misery and squalor. This was probably also the condition in the other large towns. It may then be safely concluded that there was very considerable danger of the Japanese having a large sick rate from diseases contracted from the inhabitants, but on the other hand they were not compelled to encounter some of the epidemics which have made large inroads on armies in the past. For example, cholera did not appear, and malarial fevers, so prolific a cause of sickness in certain places, were absent.

The following special diseases, their occurrence, and methods for their prevention will now be discussed:

Water-borne diseases: Typhoid fever, dysentery, cholera, and diarrhea; typhus fever, beriberi, smallpox, tuberculosis, diphtheria, scarlet fever, measles, mumps, recurrent fever, erysipelas, tetanus, leprosy, influenza, cerebro-spinal meningitis, venereal diseases, malarial fevers, transmissible eye diseases, intestinal parasites.

Water-borne diseases: Typhoid fever, dysentery, diarrhea, and cholera.—This class of diseases received perhaps the greatest attention from the sanitarians of the Japanese army. Typhoid fever is common enough in Manchuria, though it does not constitute the danger there which dysentery and diarrhea do, as the latter affections are extremely prevalent. As has just been stated cholera did not make its appearance during the war. The methods adopted to obtain a good water supply for troops at all times have already been described, and the statement has been made that the above-named diseases were isolated, etc., as carefully as others denominated contagious. A few words remain to be said, however, in reference to other special methods of prevention for this group. The Japanese clearly recognized the possibility of infection by flies. As has been noted elsewhere, conditions were such that flies, which swarm in Manchuria, could not be prevented from coming into contact with fecal matter. The army was, therefore, compelled to rely on preventing flies from reaching their food by only serving it immediately before it was eaten and by protecting all dishes, etc., from their visits by keeping them covered constantly after washing them. The screens to stop access of flies to field hospitals have also already been mentioned. Lettuce and other greens of the same class grow plentifully in Manchuria, and it never seemed to me, personally, that sufficient care was taken by soldiers in regard to their use.

The Japanese, in addition to the careful sanitary methods already outlined for preventing water-borne diseases, thought that they could diminish their frequency by the use of an intestinal antiseptic. It is believed that their medical officers made a very bad mistake in recommending an intestinal antiseptic for this purpose. The subject of intestinal antiseptics

has been thrashed out so thoroughly in the United States that it is not necessary to enter into it here, but it is believed that the creosote employed by the Japanese was absolutely useless so far as preventing typhoid fever and dysentery was concerned, and that the prolonged use of creosote was harmful, as it so disorders the digestion. Creosote pills were issued to each officer and soldier in a small tin box. Written on this box was the following inscription: "To defeat the Russians take one pill three times a day." By thus appealing to the patriotism of the soldiers the pills were undoubtedly taken and the Japanese surgeons were very loyal in insisting on their value, though many of them did not believe in their efficacy.

Personal observation indicates that the Japanese forces in the recent war, as compared with other armies, enjoyed remarkable freedom from the so-called water-borne diseases. If typhoid fever had been relatively uncommon in the Japanese army, while at the same time dysentery was frequently encountered, in view of the fact that typhoid is not so common in the Japanese population generally as in England and America, for example, an argument might have been based on the assumption that the Japanese enjoyed some racial immunity to the former disease, and for this reason they did not suffer heavily from it in their army. This was not the case, however; while typhoid was uncommon, the same was true for dysentery, a widespread disease in Japan. The same means were taken to prevent the two diseases; it must be conceded, therefore, that the Japanese comparative immunity from them was due to their measures of prevention and not to racial characteristics. While figures are not available to make comparison between the Japanese and the Russians' figures for typhoid and dysentery, observation leads to the belief that the Japanese did not suffer from those diseases to anything like the extent the Russians did. Very roughly, the Japanese may be said to have had about one case of typhoid and dysentery to the Russians' six. This result is so startling that it requires a brief analysis of the reasons which conferred comparative immunity on the Japanese. The Japanese in their barracks protected their cooking utensils, etc., carefully from flies. Their excellent medical

department discovered cases of typhoid fever and dysentery promptly and isolated them with celerity, neither of which practices was thought necessary by the Russians, and probably most important were the wide differences in the care with which the two armies sterilized their water, the Japanese being far superior in this. It will thus be seen that the immunity of the Japanese can be ascribed to no one factor, and it is believed that all those mentioned had an influence.

The experience of the Japanese does not indicate that if troops are in houses and sleep somewhat above the ground, soil pollution is much of a factor in the spread of typhoid fever and dysentery; neither, apparently, did they find that soiling the ground with urine in the vicinity of their habitations, which was commonly practiced by them as well as by the Chinese, was dangerous. Of course, in an army like the Japanese, where typhoid cases in soldiers are discovered so promptly, there is much less danger of infected urine being voided on the ground than if the contrary were the case.

Typhus fever.—Typhus fever is not an uncommon disease among the Chinese in Manchuria, though it is rarely encountered in Japan. The Japanese examined their typhoid cases with all requisite care, making the Widal reaction for them, yet they did not always distinguish between typhus and typhoid. No chances were taken with cases which were apparently typhus, however, such patients being separately isolated. Cases of typhus fever were decidedly rarer in the army than those of typhoid, but the exact figures for it could not be ascertained. Nothing need be added under this subject in regard to special methods of disinfection, isolation, etc.

Beriberi.—Though beriberi has been pretty well stamped out in the Japanese army and navy during peace times, it proved a terrible scourge to the former in the Russo-Japanese war. During the war the Japanese have given a great deal of attention to investigations into the cause of this disease, but have reached nothing definite as yet. Three different cocci have been isolated, each of which is claimed by its discoverers to be the cause of the disease, but further proof is needed before anything definite can be said on the subject. The experience of the Japanese navy, which, by in-

creasing its ration, practically got rid of beriberi, has always been cited as one of the strongest proofs that this disease is of diatetic origin. The experience of the Japanese army in the Russo-Japanese war is certainly opposed to this. The soldiers were well fed and ate rice to which they were accustomed, and yet the disease spread widely. It is believed that, very possibly, beriberi will eventually be found to be a disease like typhus fever, which, it will be remembered, was for many years ascribed to place infection, being called jail fever, etc., but which is now known to be transmissible from man to man, especially in crowded dwellings. As has already been noted, the Japanese soldiers were much crowded in poor barracks at home and afterwards equally so in the Chinese habitations in the fields. Ideal conditions therefore existed for the spread of a contagious disease from man to man. No attempt was made to isolate cases of beriberi.

So far as known Japanese imprisoned at Port Arthur, who received scanty rations from the Russians, did not suffer from beriberi but from scurvy. Probably Russians wholly escaped beriberi; their racial immunity was, therefore, sufficient to protect them from it, even in Japan. Conditions at the siege of Port Arthur in the Japanese army were especially bad on account of the nature of the fighting there, and beriberi was far more prevalent at Port Arthur than in the north. The Japanese surgeons say that some difference was seen in men who occupied dry ground, who escaped more lightly than those on wet, but the percentage of those attacked in these different classes is not believed to have been great. In view of belief in the dietetic origin of the disease, barley was issued with the rice. So far as known this was absolutely futile. Exact figures are not available to show the number of cases of beriberi, but it is thought that it constituted the cause of from 40 to 50 per cent of all sickness in the Japanese army. (Since the war the Japanese have stated officially that in peace only .44 per cent of the army have beriberi; in the Chinese-Japanese war, 18 per cent suffered from it, and in the Russo-Japanese war, 16 per cent.) Beriberi itself was not only responsible for much disability and many deaths, but sufferers from beriberi, when attacked by other diseases, were very prone to die, as the beriberi had so weakened their hearts.

Smallpox.—Smallpox is endemic among the Chinese in Manchuria, but notwithstanding this fact the Japanese army did not have many cases of this disease. This may be ascribed to the fact that the soldiers were thoroughly vaccinated, and were also prevented from coming in contact with the disease as far as possible, living, as they did, in Chinese houses. Vaccination is compulsory in Japan for each child within one hundred days after birth and again at the age of 12 or 13 years. Soldiers are also vaccinated on conscription, as are civilian employees when they are hired for the army. It is intended that such vaccinations be performed until it is proved that they will not be successful in the individual, but in practice it is probable that not more than two or three attempts are made to obtain a successful result. In the summer of 1905, on account of many cases of smallpox discovered in Manchuria among the Chinese and also because a few Japanese soldiers had contracted the disease, revaccination was very general. Although the Japanese vaccine virus, which is mainly bought from Professor Kitasato's laboratory, is excellent, insufficient care was taken to preserve its potency during its transportation to Manchuria, so that the proportion of successful revaccinations in the field was even smaller than it should have been considering the previous thorough vaccination of the army.

Tuberculosis.—Tuberculosis is common in Japan and probably also in China. The Japanese do not seem to have yet adopted modern methods for the care and isolation of cases of this disease in civil life, and though in the army tuberculosis patients were taken from their organizations as soon as they were discovered, it is believed there was some unnecessary spread of this disease. The bad barracks for troops in Japan have already been described, as have also their habitations in China, and on account of them many opportunities were given for well men to contract tuberculosis. As such cases are not continued in service after their disease is discovered, but are immediately forwarded to their divisions for discharge, the Japanese statistics are not at all comparable with those of the United States Army. A statement of the number of cases of tuberculosis treated in the

contagious disease hospital at Hiroshima will be found in the proper appendix.

Diphtheria.—Diphtheria is not a particularly uncommon disease in Japan, according to the general statistics of morbidity and mortality for that country, but it was rare in the army. Personally, only one case was encountered; this was at the contagious disease hospital at Hiroshima.

Scarlet fever, measles, and mumps.—None of these diseases was an important factor in the morbidity and mortality statistics of the army. Japanese surgeons think that measles appears only in isolated cases because of its extreme prevalence in Japanese children generally, all soldiers, in consequence, being protected by previous attacks.

Recurrent fever.—Recurrent fever is understood to have been common in the Chinese-Japanese war and to have been brought to Japan by returning troops at the close of that contest, with subsequent infection of numbers of the general population. In the more recent war in Manchuria, recurrent fever was rare, though it did occur. Cases of this disease were isolated with as much care as were other epidemic affections.

Erysipelas, tetanus.—Erysipelas and tetanus were both uncommon, practically being only found when infection occurred through a wound. The statistics for the Hiroshima Contagious Disease Hospital appear in the appendix on sanitation.

Leprosy.—Leprosy is not particularly rare in Japan. It was not, however, a common disease in the army. The statistics of the hospital for contagious disease at Hiroshima show the number of cases of leprosy sent there. As all such cases were of course immediately returned to Japan on their discovery, the figures for this hospital may be taken to represent the total for practically all leprosy which appeared in the Japanese army, except for the two divisions whose sick were sent to Moji, and for a very few other troops.

Influenza.—There were a number of cases of influenza in the army, both during the summer and winter seasons. The disease was not usually of a severe type, but was of considerable interest in view of the fact that it was sometimes difficult to diagnose it in its early stages from typhoid fever. In the summer of 1905, a disease called "Manchurian fever"

appeared in the army. This name was not given to it by the surgeons, but it was commonly so spoken of by soldiers, who included all fever cases under the term. About half of those attacked with fever really suffered from influenza, and a number of the remainder from typhoid fever. Influenza was not isolated, but no chances were taken with cases which might prove to be typhoid, these being carefully segregated, just as though they were actually suffering from the latter affection.

Cerebro-spinal meningitis.—Cerebro-spinal meningitis was not seen in the field—that is, no cases of this disease were personally encountered—though there were undoubtedly a very few of them. The statistics of the contagious disease hospital at Hiroshima show that it was not so very uncommon there. It was isolated in the same manner as the other epidemic diseases.

Venereal diseases.—The Japanese were very successful in preventing venereal disease in their armies. As is well known, Japan has carefully segregated prostitutes for many years and has provided for the removal of those afflicted with venereal diseases from the houses of prostitution, with their compulsory treatment. Practically the same methods in vogue in Japan were pursued in China, a few Chinese prostitutes being permitted to practice their calling in Mukden, Tiehling, and the other large towns in Manchuria, but always under the strictest supervision of the Japanese authorities. Some difficulty was experienced early in the war in Hiroshima, and a number of men became infected with venereal diseases, but more stringent application of existing laws largely eliminated danger from this source. As will be seen in the Health Memoranda for Soldiers, patriotism and love of family are both invoked to prevent soldiers from cohabiting with women indiscriminately.

Malarial fevers.—Malarial fevers were not met with in the Japanese army in Manchuria, except a very few cases of old infection, principally in soldiers who had served in Formosa. Some investigations on mosquitoes in the vicinity of Port Arthur have resulted in reports to the effect that a special species of anopheles is found there. The majority of mosquitoes examined in all Manchuria were, however, culices, and

if further study confirms the statement that anopheles are present in the south, yet it is safe to say that during the war they did not convey malarial infection from man to man.

Transmissible eye diseases.—Trachoma is said to be widely disseminated among the Japanese, but, in the field, there was practically no spread of this disease. In fact it is not believed that many soldiers suffered from it to an extent which required treatment.

Intestinal parasites.—Intestinal parasites are common in Japan, but it is thought that they were even commoner in the Japanese troops in Manchuria, where they are frequently encountered in the inhabitants.

General results in the prevention of disease.—Detailed statistics dealing with special diseases are not yet available for study, but since the war closed the Japanese authorities have made some general statements on morbidity and mortality which are of extreme interest. The latest data obtainable at the time of this report going to press will be found in the appendix on statistics. The common method of estimating the hygiene of an army is to compare the number of deaths from wounds with those from disease. This, at the best, is a very loose means of calculation, as an army, in a short campaign, with heavy fighting, may, even if its sanitary precautions are very defective, have such a great number of casualties from wounds that the relative proportion of deaths from disease will be small. The Japanese in their recent war offer good examples of this. At Port Arthur the nature of the fighting was such that sanitary precautions could not be carried out nearly so effectively as in north Manchuria, and yet at that fortress so many men were hit that deaths from disease were relatively uncommon there. Moreover, if the war had closed with the battle of Mukden, Japanese statistics, based on the relative number of deaths from disease and those from injury, would be much more favorable to the sanitary service of the Japanese army than is the case at present, as practically all deaths after Mukden were due to disease. However, comparison of deaths from wounds with those from disease has been justified by custom, so it must be accepted here, in order that the sanitary records of the Japanese in the recent war may be contrasted with those of other armies in former wars and also to a certain extent with those

of the Japanese in some of their earlier conflicts, though some other figures for the latter are available. In the Russo-Japanese war the Japanese report for their field army, 1 death from wounds to 0.47 died of disease. This is not wholly satisfactory for purposes of comparison with other armies, however, as the general custom has apparently been to take the whole army mobilized rather than the field force.

Naturally an army as a whole, including that portion of it serving at home, as compared with a field army, will have more deaths from disease relatively to those from wounds, as deaths in the home army will be almost entirely from disease. Still, a most liberal allowance of deaths in the Japanese home army could not increase deaths from disease to over 66½ per cent of those from wounds. Assuming, then, that at the most the Japanese lost three men from disease to two from wounds, yet they show a far better record in the prevention of disease than has any other army in the past. Previous to this the best figures were obtained by the Germans in the Franco-Prussian war, but taking the longer duration of the Russo-Japanese war into consideration (it ran through the winters and summers of nearly two years), and the country in which it was fought, etc., the hygienic results of the Japanese must be pronounced decidedly superior to those of the Germans.

The final statistics are also interesting in showing how notably the Japanese have benefited in army sanitation by their former experience in war. The Chinese-Japanese war give 1 wounded to 6.93 sick, and 1 died of wounds to 12.09 of disease; in the north China war, the figures were 1 to 4.37 and 1 to 1.97, respectively, and in the Russo-Japanese, 1 to 1.07 and 1 to 0.47. The percentage of sick for all troops engaged and deaths from sickness for all troops engaged were as follows: Chinese-Japanese, 59.20 and 9.29; north China, 34.88 and 4.33; Russo-Japanese, 36.04 and 2.99. The figures for beriberi, which, as has already been shown, was the most important disease in the Japanese army during the Russo-Japanese war, were as follows: In peace, 0.44 per cent of the army; Chinese-Japanese war, 18 per cent, and Russo-Japanese, 16 per cent.

Without beriberi the Japanese could have shown results so good that they would have upset previous ideas on the subject of sanitation in war. This brings out another point as it will be seen that with diseases of which the methods of communication from person to person are known, they attained far better results than have other countries and, with those of which they had only empirical knowledge, they failed as completely and utterly as has every other army.

As a measure of the sanitation of the Japanese army, comparison of the results attained by it in the prevention of disease with those of the Russians in the same field would be of most value. This is, unfortunately, impossible at present, however, nor will the future give any figures suitable for this purpose. Probably the collection of morbidity and mortality statistics by the Japanese in their recent contest of arms has never been excelled, both as to completeness and correctness, by any army engaged in a great war. The Japanese are excellent statisticians, correct records being demanded in all the higher walks of life for future study with a view to improvement. In the army everything is written down and collated and distributed for the instruction of officers after a war is over, and without any question dependence may be placed on the Japanese medical statistics for the war. On the Russian side, on the other hand, everything was opposed to gathering good statistics. In the first place, Russia as a nation certainly does not encourage the collection of statistics, and only superficial study of the history of the Russians in the Russo-Japanese war is required to show that army records were not well kept. Good medical department records are peculiarly difficult to secure in any army, and in the Russian service in the recent war the medical department had even more troubles to contend with than the line, for the latter was, at least, composed of military men who had received some teaching in regard to the necessity for army records, while many of the former were ophthalmologists, obstetricians, medical students, etc., gathered from here, there, and everywhere in the Russian Empire, with no knowledge of methods of keeping army records nor the necessity for them. Moreover, in numerous instances they were specifically directed in orders to sacrifice

records to other work. In addition, in the Russian army the Red Cross has its separate establishments, which much complicates the keeping of patients' records. For these various reasons it is considered absolutely futile to base any conclusions on Russian medical statistics. There are, of course, three ways by which the percentage morbidity and mortality records of an army can be reduced: First, by certain sanitary measures; second, by giving a greater strength of command than that actually present, and, third, by failing to report all cases. That the Russians, to their great credit, resorted to the first to an extent that was not generally believed possible is undoubtedly true, but their percentages of sickness were generally based on paper strength—that of full ranks—and according to expert opinion this was at least 30 per cent too high, and as all sick were not reported they naturally could not be included. No official statement can, of course, clear statistics of these sources of error, and those made by the Russian Government since the close of the war show other possibilities of wide discrepancies, as missing are given as between 35,000 and 40,000, and the army at Port Arthur, with its thousands of Russian sick, is not included. It is but fair to state that the convictions expressed above are not merely my own, but are rather an echo of the opinions of Russian surgeons encountered at Matsuyama, Port Arthur, and Mukden, none of whom seriously thought that the Russian medical statistics for the war could be either correct or complete. Judging exclusively from the statements of these Russian authorities, the percentage of loss from disease in the Russian army was at least twice that of the Japanese, and the former had a constant ineffective rate from sickness of quite three times the latter.

PRACTICE OF MEDICINE AND SURGERY.

The practice of medicine on the Japanese side in the recent war requires but a few words of discussion. The contagious diseases encountered have already been described at length under their sanitary aspect, and the methods for the treatment of these and of pneumonia, rheumatism, and bronchitis, which were frequently seen, do not differ materially from ours. Their constant and intelligent use of the microscope for diagnosis, even well up to the front in the field, is to be commended. Japanese physicians generally are much better instructed in this particular than they are on methods of physical examination. In the latter they are neither very apt, nor accurate in reaching conclusions. The Japanese are peculiarly prone to allow patients with serious illness to assume a sitting position, and I can not but think that this was a dangerous practice, particularly so as many of these men had bad hearts from beriberi. In all the Japanese hospitals, except the most advanced, separate rooms are provided for the very ill. Without their large personnel this would be impracticable, though it would always, as with them, be much better for the patients. The percentage of deaths in both dysentery and typhoid was rather high, between 7 per cent and 9 per cent in the former and from 15 to 16 in the latter. The Japanese ascribe this to the fact that many of these patients had beriberi and so weak hearts.

No scurvy was seen in the Japanese army except among some prisoners who had been confined at Port Arthur by the Russians. At this fortress hundreds of cases of this disease in the Russian garrison were under treatment at the time of my visit there. On account of their poor ration, scurvy is not particularly uncommon in the Russian army, even in peace. It was rather surprising to learn how soon a great deal of scurvy began to appear among the Russians at Port Arthur; according to the best obtainable information, scurvy

was common even as early as May, 1904. Anticipating a long siege, the Russian authorities cut down their ration notably soon after Port Arthur was surrounded. It was the general opinion among the Russian surgeons there that the food supplies available could have been much better utilized; for example, nearly 2,000 horses were captured when Port Arthur surrendered, which, if they had been killed and issued as a part of the ration, would have been of much value in preserving the health of the soldiers. Russian officers were apparently sufficiently well fed during the siege; at least, not a single case of scurvy was seen in them. Probably no opportunity for the study of scurvy for years to come will approach that given at Port Arthur. All classes of this disease could be seen there, hemorrhages into the skin, hemorrhages into the conjunctivæ, effusions into the knee joints, and even separation of the ribs from their cartilages. In nearly all cases, as soon as patients obtained good food in sufficient quantities they rapidly recovered. So far as can be learned, the scurvy in Russian troops was due rather to a nitrogenous starvation than to general deficiency in the food supply.

Some of the surgical problems met with in the war are of great interest. Practically all wounds were caused by rifle bullets, shrapnel or shell, explosives, swords, and bayonets. All statistics obtained in reference to wounds will be found in a special appendix, these deserve study; their analysis here will be a brief one.

As preliminary to this discussion, attention should be called to the fact that in classifying wounds by cause, location, severity, etc., account was only taken of wounded who received treatment and of a few men dying en route to aid stations. This is important in estimating the relative effectiveness of the different arms. For example, with artillery projectiles, many more men were killed outright than by rifle fire, so that the results accomplished by the former arm were in reality far superior relatively to those shown by the figures given here. Perhaps even a more striking contrast was presented with hand grenades and with bayonets. Men injured by the former, in a large percentage of cases, were either killed outright or died before succor could reach them, and therefore do not appear in the statistical returns, while bayonet

injuries, inflicted with the Russian bayonet, resulted in few deaths, but were severe enough to require treatment, so that a large percentage of all such wounds were entered on the hospital records. The methods of the Japanese in this particular were, of course, the same as those which have been pursued in other armies in the past, yet the wounding agents have so changed that the point made deserves consideration in reading the figures which follow:

For the First Army complete statistics are available; this, it will be remembered, was always engaged in field and not in siege operations. Its percentage of rifle wounds is given as 84, shell 14, and bayonet 0.9. Differences in classification in different battles, etc., give rise to a very small error in calculating these percentages. In the Third Army, which, up to the battle of Mukden, was at Port Arthur, and so had only one field fight—that of Mukden—the rifle wounds were 59.44 per cent; cannon, 19.63; bayonet, 0.59; miscellaneous, 12.13; untraceable, 8.11. Full figures for the Second Army at the battle of Mukden are: Percentage of rifle wounds, 85.83; shell wounds, 13.73; bayonet wounds, 0.45. It is safe to conclude from these figures that, though the rifle has retained its preeminence as the wounding weapon in war, shell wounds have notably increased; in the field nearly all wounds classified as shell wounds were caused by shrapnel. Some wild statements in reference to the frequency of bayonet wounds have been circulated; even so large a percentage as 7 of all wounds has been ascribed to the bayonet. As a matter of fact, in the whole war not 1 per cent was due to this weapon. The large number of miscellaneous wounds in the Port Arthur army is notable. Some of these were caused by hand grenades, which were used largely there and to a considerable extent in the north in attacks on entrenched positions. All of these grenades were actually thrown by hand in the early part of the war, but later the Japanese made little mortars, some of them of wood, in which a small charge of powder gently lifted a can containing a high explosive, usually Shimose, from 200 to 400 yards, where a frightful explosion would occur.

The First Army reports 32.03 per cent of severe wounds, 53.5 per cent of slight, 14.47 per cent very slight; the Third

Army 26.76 per cent severe, 69.6 per cent slight, 3.54 per cent very slight. The Japanese classify as a severe wound one which so disables the recipient that he must be carried from the field; actually, some very severely wounded men staggered back to the dressing stations alone or with the assistance of less badly hurt companions. The figures in reference to the severity of wounds do not differ practically from the ones which are generally used to calculate the amount of transportation which will be necessary for wounded in battle.

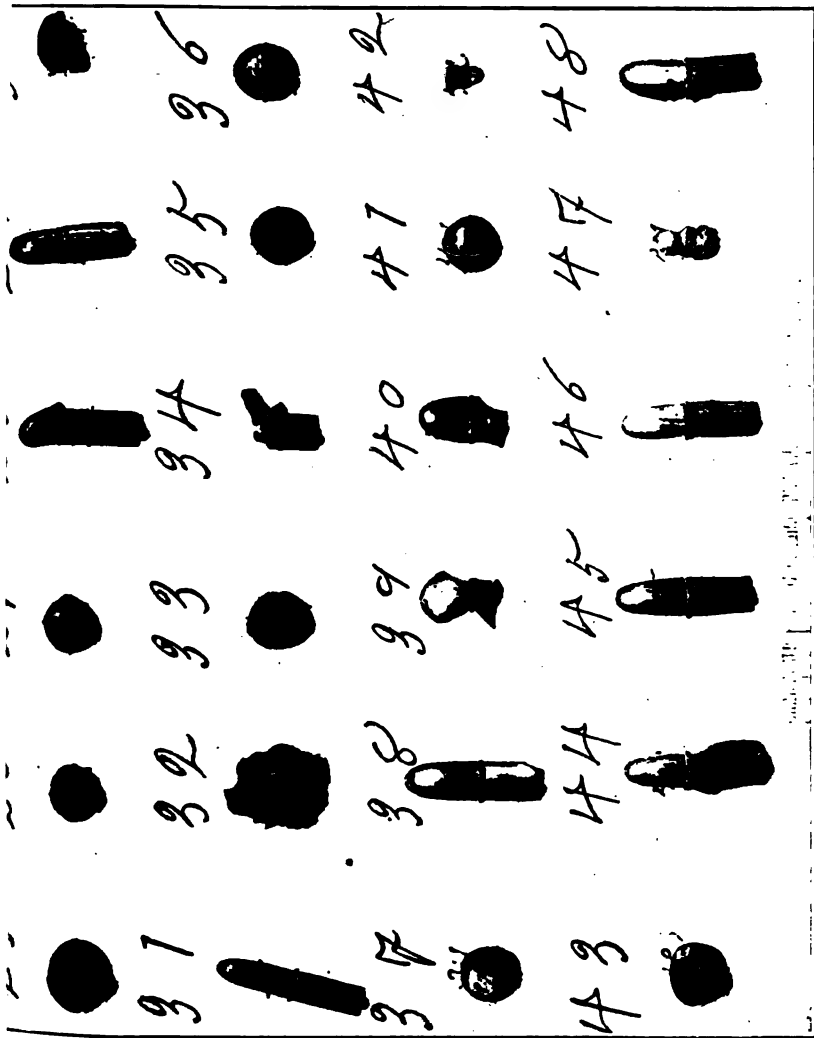
The total number of wounded in the First Army was 16,811, the number of killed, 4,789; in the Second Army 10,070 were killed, 38,159 were wounded, and in the Third 19,363 were killed, 76,586 wounded; the proportion of killed to wounded was therefore higher than in other recent wars. The location of wounds, based on 7,489 non-selected cases in the Second Army, showed the following percentages: Head and neck, 16.08; trunk, 30.31; arms, 25.16; legs, 28.26; sexual organs, 0.20. The percentage of head wounds is rather higher than that usually found in field fights; this was to be expected, however, as the men were frequently intrenched, so that the head was much exposed relatively. Many cases of multiple wounds were seen. The percentage of wounded, according to branch of service, with the Second Army, from May 4 and to include January 5, was, for the infantry, 36.27 per cent; engineers, 14.33 per cent; artillery, 8.44 per cent; cavalry, 6.22 per cent; sanitary company 5.57 per cent; surgeons, etc., 4.66 per cent; train, 0.51 per cent. The percentage of wounded surgeons and sanitary company is lower in this table than it was for all armies in the whole war; reports from some armies show that their percentage of casualties was between that of the infantry and artillery. A complete record of medical department casualties is found under medical personnel.

There are considerable differences between the Russian and the Japanese rifles. The former has a caliber of 7.6 millimeters; its cartridge weighs 24 grams. The bullet weight 14 grams, has a jacket of cupro-nickel. Its initial velocity is 2,015 feet per second. The Japanese rifle is 6.50 millimeters in caliber; the cartridge weighs 22 grams; the charge is 2.10 grams of smokeless powder. The bullet, which weighs 11½

grams, is 32 millimeters long and is made of hard lead, with a German silver jacket. The initial velocity is 2,356 feet per second.

The different initial velocity, etc., of the Japanese, as compared with the Russian rifle bullet, was not found of great importance, so far as the effects produced by it on the tissues of men hit were concerned, though it is possible that more Russian bullets lodged. The difference in caliber of the two rifles was responsible, however, for very great differences in the wounds caused by them. The wounds due to the Russian bullet were always of a much more severe character. While from the surgical standpoint the extremely small caliber of the Japanese rifle is desirable, it is a great question if they have not carried their desire for long range, flat trajectory, and light weight of cartridge too far, and have thus sacrificed the stopping power of the bullet to such an extent that their weapon does not yield the best results in war. Certainly, a man hit with the Japanese bullet will come on when it has passed through his body anywhere, except at a vital point.

The wound of entrance of the Russian bullet was naturally of larger size than that of the Japanese, as was also the wound of exit. The greater destructive effects of the former were, however, most manifest when bony tissue was struck in its course through the body. Bone was almost always extensively comminuted, and the wound of exit caused by the bullet after passage through bone was large. In the winter, at least, many rifle bullets, the Russian more than the Japanese, were deformed by striking hard ground or frozen walls, and wounds produced by such bullets were of course always destructive to both soft and bony tissue on account of the large wounding surface of the missile. Shrapnel bullet wounds were also always of a severe character, both on account of the large size of the shrapnel bullet and because of the material of which it was made—soft lead, which is so liable to deformation. Wounds produced by pieces of shell were of course even more severe, and frightful injuries were caused by hand grenades. With the last, tissues were so lacerated and torn generally that amputation of injured limbs was almost invariably re-



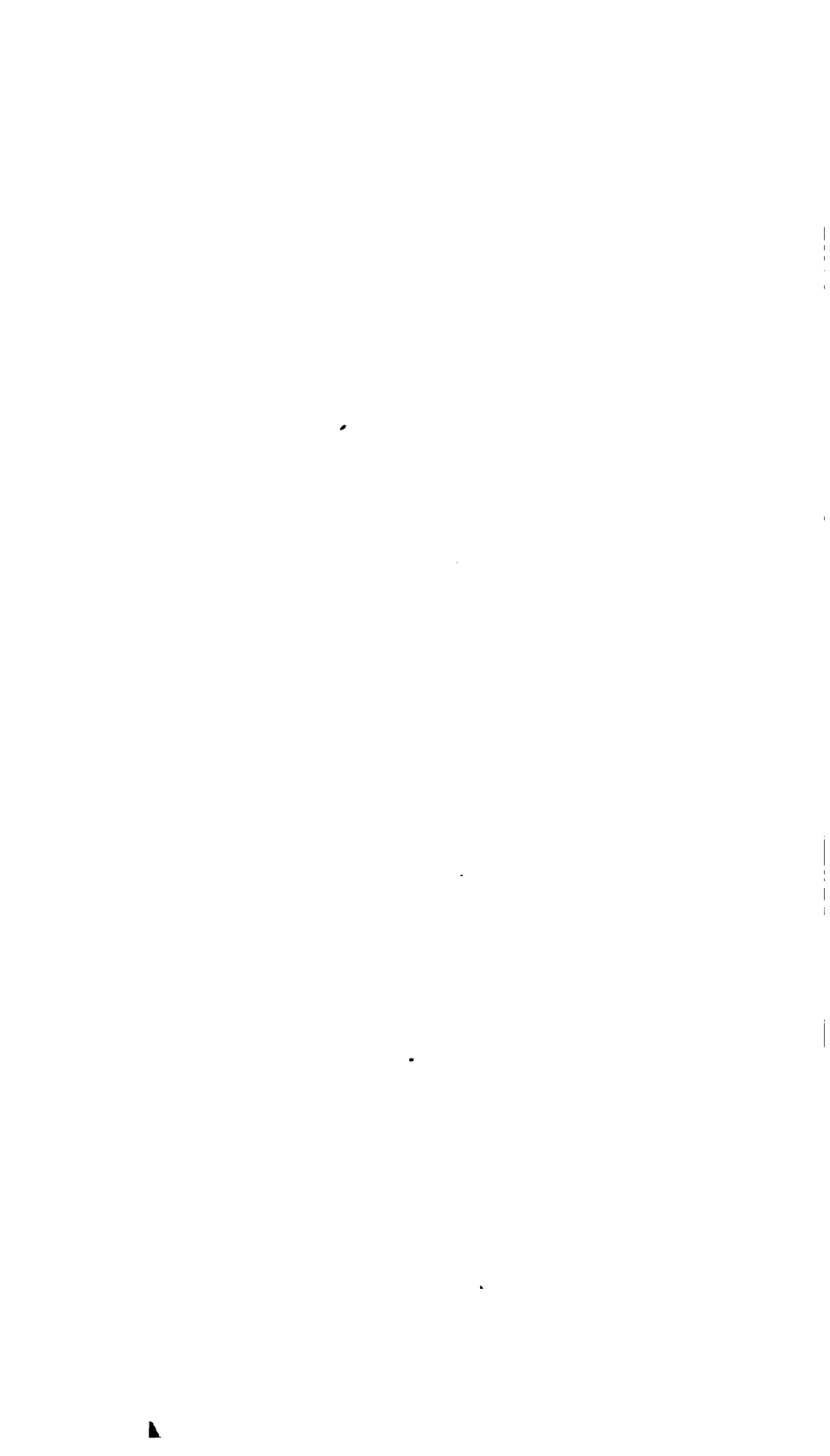
68. TYPES OF MISSILES RESPONSIBLE FOR THE MAJORITY OF THE WOUNDS OF THE WAR. NO. 31 IS A JAPANESE RIFLE BULLET. THE OTHER RIFLE BULLETS ARE RUSSIAN. NO. 32 SHOWS A PIECE OF CLOTH CARRIED INTO A WOUND BY A SHRAPNEL BALL. THIS PHOTOGRAPH CAME FROM THE PRINCIPAL HOSPITAL IN HIROSHIMA, WHERE THE BODIES PICTURED WERE REMOVED FROM THE TISSUES OF WOUNDED.



69. CASES CONTAINING FOREIGN BODIES REMOVED FROM RUSSIAN PRISONERS OF WAR AT MATSUYAMA. NOTICE PARTICULARLY THE END OF THE SHELL IN THE UPPER CASE. THIS ENTERED A MAN'S PLEURAL CAVITY BETWEEN THE RIBS, AND WAS EXTRACTED; HE ULTIMATELY RECOVERED. IN THE LOWER CASE A DRAINAGE TUBE IS SHOWN.



70. EXPLOSIVE EFFECT ON BONE OF JAPANESE RIFLE BULLET AT SHORT RANGE.





71. WOUND PRODUCED BY HAND GRENADE.

quired. Foreign bodies were not frequently carried into wounds by the Japanese undeformed bullet, and were still rare with the Russian undeformed bullet. With both, deformed they were not uncommon. The shrapnel ball also frequently drove foreign material from the men's clothing into wounds. Fragments of shell sometimes did so, but often tore their way through, carrying everything in their path before them. With hand grenades not only were particles of clothing sometimes carried into wounds by fragments, but stones and dirt were frequently driven in by the explosion.

Whether suppuration occurs in a wound produced by a missile is, of course, dependent both on the character of the missile and also on the subsequent care which the wound receives. My opinion on the efficiency of the means employed in the war to prevent suppuration will soon be expressed, but, just at this time only the exact results attained will be recorded. The Japanese surgeons state that, with undeformed Russian bullet wounds, not more than 20 per cent of wounds of soft parts suppurated; but, from personal experience, it is believed that this figure is much too low and that it should be set at least 60 per cent. So far as suppuration was concerned wounds produced by the Japanese bullet were much less liable to it than were those by the Russian. This was more noticeable when such wounds involved bone as well as soft parts. A number of bone wounds caused by the Japanese bullet were seen, which healed kindly, that must inevitably have suppurated if they had been due to the Russian bullet. In fact practically all bullet wounds involving bone, caused by the Russian bullet, suppurated, while many produced by the Japanese did not do so. The character of wounds produced by most deformed bullets, by shrapnel, pieces of shell, and hand grenades, was such that they almost invariably suppurated. Those due to the first named were less liable to do so, shrapnel wounds somewhat more so, and wounds caused by fragments of shell or hand grenades never escaped suppuration.

Bayonet and sword wounds were so comparatively rare that data in regard to them are very incomplete as compared with those for the wounds just described. The few bayonet

wounds seen that were due to the Russian bayonet were not severe injuries. Whether or not such wounds usually suppurred can not be stated positively, but it is thought that a great many of them did so. Out of thousands of wounds examined it chanced that only one sword wound was seen. This occurred in an otherwise severely wounded soldier and was undoubtedly inflicted after he had fallen to the ground. Aside from the situation of the wound, it was not of very severe nature.

Japan may be said to be yet in the presurgical stage of her development—that is to say, she has not reached a realization of the beneficent effects of good surgery, and in civil life surgery is a last resort, rather as it was with us in pre-antiseptic days. This has resulted in little specialization in surgery, and while many men may be found who have done good work in bacteriology and pathology abroad, few surgeons with foreign instruction are met. This does not apply to surgery of the eye, for which there is apparently great demand in Japan, and in which a number of physicians have specialized and do good work. In general surgery the Japanese invariably adopted the easiest methods mechanically, such as circular amputations, and they, though perhaps the best organizers in the world in many respects, did not organize their operating-room staffs, so that much confusion resulted from lack of specialization of duties. The surgeons, too, are apparently rather limited in their methods of surgical treatment. For example, iodoform is universally used for all dressings. They believe, it is true, in antiseptic rather than aseptic methods for war surgery, and they are probably absolutely right in this as a matter of principle, but, they pursue routine methods too closely. Army surgeons in any country are naturally in great measure dependent on the general surgical teaching of the country in question. This is quite true in Japan, and the reason that army medical officers are not competent surgical practitioners is not because their teaching and experience are inferior to those of civilian surgeons, but because good surgery has not been imported nor developed in Japan. As a matter of fact, Japanese army medical officers, as a class, are probably much better surgeons than are the civilian doc-



72. SWORD WOUNDS.



73. FROST BITE, WITH LONG INCISIONS OF A RUSSIAN SURGEON, MADE PRESUMABLY TO RELIEVE TENSION.

tors of that country, as, with the former, war gives surgical opportunities of relative importance, just as it formerly did with us.

My opportunities for the study of surgery, as practiced by the Russians, were fairly good at both Port Arthur and Mukden. Though these did not compare favorably, of course, either in duration or thoroughness, with similar opportunities with the Japanese, it is believed they were sufficient to form just conclusions on the work of the Russians in this line. The Russian surgeons, as is well known, were picked from here, there, and everywhere in the Russian Empire. Some of them were surgical specialists, but others were obstetricians, general practitioners, ophthalmologists, etc., and not a few were medical students. The relative surgical ability of these different classes varied very widely, quite in contrast to the Japanese, who were all from the same mold. Speaking generally, there is no doubt but that the Japanese surgeons were superior to the Russians, even with their deficiencies, which have already been discussed. What is needed in war is a high general average in surgical skill rather than a few specially skilled surgeons, as conditions are such that wounded must necessarily be treated at widely separated points; that fine surgeons would not find a good field for employment can not be maintained, however. If the Russians had such surgeons they certainly should have been found in the great hospitals at Port Arthur and Mukden, as a matter of fact, they were not encountered in either place. Russian surgery, as exemplified by presumably as good men as they had at these two towns, was no better than that usually seen in the Japanese hospitals. However, it was quite different from the latter in many respects. The Japanese certainly never tried to gain experience at the possible expense of their patients, but whether this was equally true of the Russians is not so clear. The latter were specially inclined to make very long incisions to relieve tension. These were often made without reference to the direction of the muscles, the fibers of which were ruthlessly cut transversely. The worst case of this kind seen must be described. It occurred in a Japanese soldier who had received a bullet wound at Mukden. The bullet entered 2 inches be-

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low the left trochanter, with no wound of exit. The urethra was injured so that there was some hemorrhage from it, and the patient required catheterization. The Russian surgeon, presumably to relieve tension, made a deep, vertical, central abdominal incision 3 inches long, two other incisions 4 inches in length, parallel with this and 2 inches from it, on each side, and two other incisions 7 inches long, $1\frac{1}{2}$ inches above and parallel to Poupart's ligament, on each side. Whether this manifested recklessness or was due to lack of surgical knowledge is a question, but such practice was so unjustifiable as to be almost criminal.

The Japanese criticise the Russians for their early and radical operations generally. Apparently there was ground for this. Some of the photographs show head wounds where the openings through the skull were entirely too large, and the Russian surgeons removed bullets from the head and from other tissues not infrequently which would much better have been left where they were, as no harm was resulting from their presence. Mechanically, Russian surgical work was somewhat better than Japanese, but they did not equal the latter in surgical cleanliness. The Russians placed their reliance on aseptic rather than antiseptic methods, and their asepsis was not good. While it is believed that the Japanese medical officers always did the best they could for their patients, a little thing showed their thorough army training. This was their classification of their surgical cases, in conversation, and also evidently in thought, as those which were capable of evacuation to the rear and those which were not so.

As has been stated under the head of materiel, the Japanese were extremely unfortunate in having a very bad first-aid packet. The Japanese soldiers had been fairly well instructed in the application of the first dressing, which, as a rule, was put on by a comrade of the wounded man. Each Japanese soldier was supplied with a packet, and inspections were always made by medical officers before a battle to ascertain that each man had his packet, and that it was in good condition. As has been noted, the Japanese surgeons state that in the Chinese war surgeons were able to give personal attention to a large majority of the wounded, and that, in consequence, suppuration was relatively uncom-

mon there. This is believed to be true, but, in a great war such as the recent one, soldiers must be dependent to a large extent on unskilled first aid, and the packet should be one which the soldier or a comrade may apply without infecting a wound. This was not the case with the Japanese packet, and a great deal of pus infection was without doubt due to its worthlessness for the purpose for which it was used. The Russian first-aid packet was much better than the Japanese. It had two large compresses of bichloride gauze, with a layer of cotton interposed, and a bichloride gauze roller bandage. The Russians did not issue the packet to a large percentage of their men, however, and those who had it apparently knew little of the proper methods of applying it. Both the combatants therefore failed to gain the benefits which must have accrued to wounded from a good first dressing, well and promptly applied. It is hardly necessary to state that the future course of many a wound is absolutely dependent on its proper protection by the first dressing. At dressing stations many wounded were re-dressed by the Japanese. Their small and ineffective first-aid packet was of course partly responsible for this, as first dressings, on arrival at dressing stations, were likely to be soaked through with blood, so Japanese surgeons could hardly depend on their properly protecting wounds.

Where possible, the Russians provided separate rooms for dressings and for operations. This was not the Japanese custom, with them all dressings being changed, bandages applied, etc., in the operating room. This undoubtedly resulted in pus infection of some clean cases, which would have escaped if a clean operating room had been provided for them. In each of the great war hospitals in Japan it is probable that the best plan would have been to have had an entirely separate staff, operating room, wards, etc., for clean cases. Gloves, so far as seen, were used neither by the Russians nor Japanese. There may be a difference of opinion as to the propriety of wearing gloves for certain operations in civil practice, but in war they would undoubtedly be of the greatest value. Much war surgery requires no particular manual dexterity, and the conditions of life in the field are such that it is practically impossible for surgeons to clean their hands.

Irrigation for nearly all wounds was resorted to by the Russians, while it was never employed by the Japanese. Very often with the latter wounds were dressed dry, and when fluid was used this only consisted of bichloride solution squeezed from a wet pledget of gauze. Usually the Russians employed sterilized water for irrigation, but alcohol was sometimes used for this purpose. The Russians commonly painted the surface around the wound with iodine. The Japanese never did this; the procedure probably had little practical value. The gauze used by the Japanese was sterilized immediately before use, while the Russians commonly relied on ready sterilized gauze. Only one article of the Russian surgical equipment requires mention. This is their starch bandage, which is excellent. After application they employed its white surface to note the character of operation and date, using an indelible pencil. This proved very convenient, as a surgeon could see at a glance, in going through a ward, which cases required examination or redressing.

The two German surgeons who came from their own Red Cross to the aid of the Japanese society were high-class men and did all surgery which was given them in a masterly manner. Some good surgical work was also seen in the Presbyterian Mission Hospital in Mukden, where Doctor Christie, the surgeon in charge, had a number of Chinese, on whom he had operated with the best results.

Detailed surgical statistics from which conclusions of value might be made are not available for the Japanese army. It will therefore be necessary to await their publication before anything conclusive can be said on this subject. As stated in another connection, probably no country which has been engaged in war has collected more valuable statistical material than have the Japanese. It is only very recently, however, that they have published their detailed medical records of the Chinese-Japanese war, so it is probable that some years will elapse before their recent vast experience is given to the world. While the Russians must have some interesting material on the surgical history of the war from their side, their organization is such that any publications on this subject must represent individual work rather than that of their medical department as a whole for the entire war. This is not



74. ACUTE AND SEVERE INFECTION FOLLOWING GUNSHOT WOUND OF THE LEG.

meant to imply that the Russian surgical records will not be valuable in their way, but only to show that they will not be fairly comparable with the Japanese. This is hardly the proper place for analysis of the few papers which Russian surgeons have already written on their surgical experiences in the war.

According to a statement received from the surgeon-general of the Second Japanese Army, 19 per cent of the wounded of that army recovered in the field, 65 per cent were sent to Japan, and 16 per cent died. These percentages only show what occurred while wounded were under the jurisdiction of the medical department of the Second Army and are therefore of limited value. No general statistics are yet available to show the percentage of wounds followed by suppuration in either the Russian or Japanese armies. There is no doubt, however, that neither combatant attained as good results in preventing pus infection as they should have. There was no hospital gangrene, it is true—one would hardly expect that under modern methods of surgical treatment—but there was a very high percentage of infected cases. In some the type of infection was exceedingly severe. The *Bacillus pyocyaneus* was often responsible in part for the suppuration of wounds.

Some of the causes responsible for suppuration have already been alluded to briefly, but on account of the importance of this subject, even at the risk of repetition, a summary of the more important reasons for infection and noninfection of wounds will now be given. The Japanese had much harder conditions to meet on account of the comparatively large caliber of the Russian bullet, which demanded careful dressing of wounds produced by it in order to prevent suppuration; their first-aid packet was a poor one; there was too much changing of dressings under conditions such that infection of wounds was likely to occur; their practice of not having separate rooms for making dressings and for operations was liable to cause infection of previously clean wounds. On the other hand, they had supplied each soldier with a first-aid packet, and each man was fairly well instructed in its use; with them, men were quickly collected from the battlefields, so that they were not exposed to the many chances of infecting their wounds ac-

cidentally; the practice of antiseptic methods in their operating rooms was fairly good, and their surgeons were in sufficient numbers to change dressings under antiseptic precautions. The Russians had injuries to treat which were very much less liable to infection than the Japanese, their tiny entrance and exit bullet wounds sometimes permitting smooth recovery without suppuration and even without dressing; their packet was better, but it was not furnished to a large percentage of soldiers, and men were not generally competent in its application; their wounded often lay on the field for some time, thus increasing the chances of wound infection; their personnel was comparatively small, so that subsequent infection was likely to occur from hurried and careless changing of dressings; their separate dressing and operation rooms are worthy of commendation, though their practice of aseptic methods left much to be desired.

As a general rule, in the field, cases were left far too long without being re-dressed, and this was responsible for a good deal of suppuration which might otherwise have been avoided. This is a condition which must obtain in any great war, however, as the large number of wounded precludes their frequent dressing. Conservatism in operating was carried far by the Japanese—too far, in my opinion. Army work, of course, demands that there be no accumulation of operated cases not able to bear transportation at the front. The Japanese, therefore, sent wounded men to the rear, so far as was possible, only operating on them when their condition absolutely demanded it. This practice was justifiable under the circumstances, but they not infrequently allowed men, after they had been received in hospitals which were prepared to do all needful operating, to go through a long siege of suppuration rather than do simple operations for the removal of dead bone, foreign bodies, and the like. As has been intimated, the Russians erred, rather in the opposite direction, being inclined to operate unnecessarily on cases which would much better have been left till a later date.

The most interesting cases observed from a surgical standpoint were false aneurisms (which, it will be remembered, were so common in the Boer war), osteomyelitis, and repairs of deformities. Though primary hemorrhage was very

rarely responsible for deaths on the firing line, false aneurisms were frequently produced by the small-caliber bullet touching an artery in its passage through the body. Arterio-venous aneurisms were also not uncommon. False aneurisms seen were practically all of the circumscribed variety. Out of the first 1,000 cases operated on in the great Japanese hospital at Hiroshima, the surgeon in charge stated that 102 were aneurisms of one kind or another. The usual method of operation for aneurism was to cut down and ligate at both ends, turning out the clot. The results obtained are said to have been good. Wounds of bone, with resulting osteomyelitis, were, of course, exceedingly common. The explosive effect on bone of the Russian bullet at short ranges was marked. Many deformities necessarily required repair, but, as new methods were not generally adopted in doing this work, they hardly merit description. Some exceedingly clever operations were made in this line at the German Red Cross branch of the Tokyo reserve hospital. One which specially attracted attention was the repair of a man's nose by taking needed cartilage from a costal cartilage.

A few interesting cases of wounds of joints were seen which were remarkable on account of the small interference with the functions of the joint produced by the Japanese small-caliber bullet. In one such case in the hospital at Mukden station the bullet had perforated the patella at about its center, then going through the kneejoint and the head of the tibia. There was no suppuration, and after three weeks motion in the joint was little limited. High gunshot wounds of the thigh are so often followed by fatal results, even under the best methods of treatment, that it is noteworthy that many such cases were observed going on to recovery in the Japanese hospitals.

The hospital at Mukden station afforded quite a wonderful opportunity for study of gunshot wounds of the head. There were 77 of these there, in 56 of which the brain had been injured. Twenty-two, or 37½ per cent, died, 9.8 per cent recovered sufficiently to be evacuated to the rear, and the remainder were under treatment at the date of observation. A great many of these cases had large cerebral hernias, which were due, in part, to the very large openings which the Russian surgeons had made through the skull. Hernia cerebri was



75. PERFORATING BULLET WOUNDS OF HEAD, SHOWING WOUND OF ENTRANCE BELOW EAR AND WOUND OF EXIT, WITH OPERATION INCISION IN CENTER OF FOREHEAD. THE LATTER IS THE SITE OF A CEREBRAL HERNIA.



76. REAR VIEW OF PRECEDING CASE, SHOWING ANOTHER WOUND, WITH ENTRANCE AND EXIT. THE LATTER IS THE SITE OF A CEREBRAL HERNIA. THE LARGE DENUDED AREA IN THE CENTER IS A BED SORE.



77. CEREBRAL HERNIA FOLLOWING GUNSHOT WOUND.



78. FROST BITE.



79. FROST BITE.

Russians stated that they had much more suppuration in winter than in summer, and it is probable that this was also true for the Japanese. Whether devitalization of wounded tissue by cold had anything to do with promoting the formation of pus in the cold weather is an interesting question, but one to which no answer can be supplied. In all cases of frostbite the Japanese allowed the line of demarkation to form before performing amputation, as they believed that it was thus possible to save more tissue. These cases were never made emergency operations, as it was not considered that they involved danger to life.

According to the Japanese official records but 0.35 per cent of all sickness in the Russo-Japanese war was due to frostbite, while in the Chinese-Japanese war 4.21 per cent was ascribed to this cause.

Since the recent war closed the Japanese authorities have published some interesting statements on the comparative results of treatment. These may be found in the appendix on statistics. As may be seen there, in the Chinese-Japanese war, of sick and wounded treated in hospital 50.94 per cent recovered completely and 14.24 per cent died, while in the Russo-Japanese war 54.81 per cent recovered completely and 7.65 per cent died. On the whole, with wounded alone the improvement was not so notable. It is true that in the later war 71.58 per cent of wounded recovered completely, as compared with 63.23 per cent in the earlier war, yet, while in the Chinese-Japanese war 7.49 per cent of wounded treated in hospital died, 6.83 per cent died in the Russo-Japanese war, and considering the difference which must have existed in the character of the wounds in the two wars, this is not a favorable showing for the last conflict. My opinion of the reasons for this result have already been stated. Apparently the Japanese ascribe it to the inability of their surgeons in the Russo-Japanese war to give personal attention to wounded to the extent they did in the Chinese-Japanese war, both because the number of wounded was much greater in the later and because the character of the fighting was such, especially at Port Arthur, that wounded men could not be succored promptly.

CONCLUSIONS.

In the course of the report, comments have been freely made on special points in the Japanese medical service, which, in my opinion, were deserving of either praise or censure; it is thought, however, that it will be well, in conclusion, to discuss briefly and broadly the accomplishments of that service, with the grand reasons for the results attained.

On the whole, there can be no doubt, I think, but that the Japanese, in their recent war with Russia, attained greater success in their medical department than has any other nation yet engaged in war. The primary reason for their success did not rest, however, in the medical department or even in the army itself; it may be ascribed to the liberality of the government. This had, evidently, a high appreciation of the necessity for an effective medical department, and was willing to pay for it. In Japan not only is the efficiency of the army of paramount importance but the failure of the authorities to furnish sick and wounded soldiers with everybody and everything essential to their good care would be bitterly resented by the people, as any such action, though it is hard to conceive how it could occur, would be regarded as a breach of good faith on the part of the government. The liberality of the Japanese Government was manifested, both in the large personnel which it furnished for its medical department and also in great appropriations for the purchase of all needed materiel. The latter can, of course, be brought in great part after war comes, but no country has as yet succeeded in improvising a competent medical personnel during the course of a war, except at very considerable sacrifices in the early part of the contest, both in the efficiency of the army and in the lives of soldiers. Japan has an army which is organized for war, and for war only, and this is true of the medical department as well as of the other branches of that

excellent organization. The former experience of the Japanese in war has been large. The strength of their medical department for their recent contest of arms was dictated by that experience, though they had by no means neglected study of other nations engaged in war, for the Japanese are earnest students of all subjects which effect them practically. This led to their making plans for a larger medical department than have other nations in the past. Their method for organizing this department, as may be seen from the report, was to maintain on the active list in time of peace medical officers considerably in excess of those needed for the care of sick and wounded then. In fact, the number of medical officers on the active list in peace was not based in any respect on peace conditions, but wholly on that which would be required for the higher administrative positions in time of war. The Japanese consider that special training and constant practice in military matters are essentials for the incumbents of such positions.

In addition to the medical officers on the active list, Japan had a large number of reserve officers, whose teaching was kept up by frequent medical maneuvers, as was also that of the Red Cross surgeons who, under the Japanese organization, really constitute an actual reserve for the army. As has been seen, even this large number of medical officers did not prove sufficient for the needs of the Japanese army in her recent great struggle, so new medical officers were necessarily appointed. Though the services of these men did not prove satisfactory to the Government, it would have been impossible to have done without them, and the methods by which they were taught and utilized were as good as could be devised. The manner in which the Japanese took advantage of voluntary aid from civilian physicians is also to be commended. Hardly more subordinate personnel is maintained in the Japanese army in peace than that required for the care of sick and wounded then, but there is a large reserve, including the Red Cross, and the methods in vogue for the free employment of civilians proved of great value to the medical department.

The personnel furnished the Japanese medical department was so large, as compared with that actually in service in

most armies in war, that the question arises as to the necessity for so many officers and men. In the field, between battles, the Japanese could undoubtedly, at times, have dispensed with some medical personnel without much difficulty. though they showed much ingenuity in so arranging that the services of all officers and men were utilized then, but in battles, or at least the battle of Mukden, the medical department was strained to its utmost, just as was every other part of the Japanese army. With all their large personnel in the recent war, the Japanese themselves are not satisfied that it was large enough to obtain the best results, and future wars will undoubtedly find them with even more officers and men in their medical department.

The liberality of the Japanese Government toward the medical department of the army was not only manifested by the number of officers and men which they supported, but also by the rewards which they gave such officers and men. In Japan, as well as in every other country, the army enters into competition with the other public services and civil practice for its medical officers. In order that the army may secure a good class of doctors, the Government has seen fit to offer adequate rank and rapid promotion to candidates for commissions in the medical department. Entirely aside from these material advantages, the higher grades in the Japanese medical service, such as hospital directors, division surgeons, etc., confer considerably dignity and honor, which must be a powerful inducement for doctors to enter the army.

With the subordinate medical personnel, as has been seen, certain inducements are also offered. It would be unfair and unwise, however, for the medical department to cause men needed for noncommissioned officers in the line to wish to leave it, and this would not be permitted. So, while in practice the medical department gets good men from the line, the best are retained there for noncommissioned officers. Of course, however, some men are naturally well fitted for the medical department who do not possess special qualifications for line noncommissioned officers, and a good class of men is therefore secured for the medical department. Inducements are also offered to retain competent noncommissioned officers

of the medical department in service. These and noncommissioned officers from the reserve afford a safe structure on which to build up a subordinate medical personnel on the advent of war.

The allowance of materiel, as mentioned above, is a liberal one, but even more important than that, in this connection, is the freedom allowed in making needed purchases. As has been seen, medical department organizations are empowered not only to buy medicines, etc., but also to purchase food, hire transportation, etc., and the methods for keeping accounts are so simple that shortages are not likely to occur from fear of difficulties in having expenditures approved nor from ignorance of methods of bookkeeping.

As has been seen, the Japanese medical department has complete autonomy. This is quite in accordance with the spirit of Japanese institutions, which are remarkably free from petty interference in details, only demanding results. This throwing of the responsibility for the entire care of sick and wounded on the shoulders of one department, so far as might be in an army, was attended with excellent results. So far as the duties of the Japanese medical department were concerned in regard to sick and wounded, aside from their strictly professional care, they were promptly succored on the field of battle, were rapidly removed therefrom and as much farther to the rear as necessary, had sufficient medical attendance at all times, with ample medical supplies, food, etc., and adequate hospital accommodation. At the same time men not requiring it were not lost from the front through lack of care on the part of the medical department. While the organization of the medical department of the Japanese army was excellent, the administration was even better, in fact the administrative skill of the medical officers of that army was of so high an order that it is not too much to say that it would be difficult in any army to find any department better administered than the medical department of the Japanese.

It is, of course, necessary that the medical department of an army shall not interfere with the operations of the army in question. The testimony of every military attaché with whom this subject was discussed—and they were many

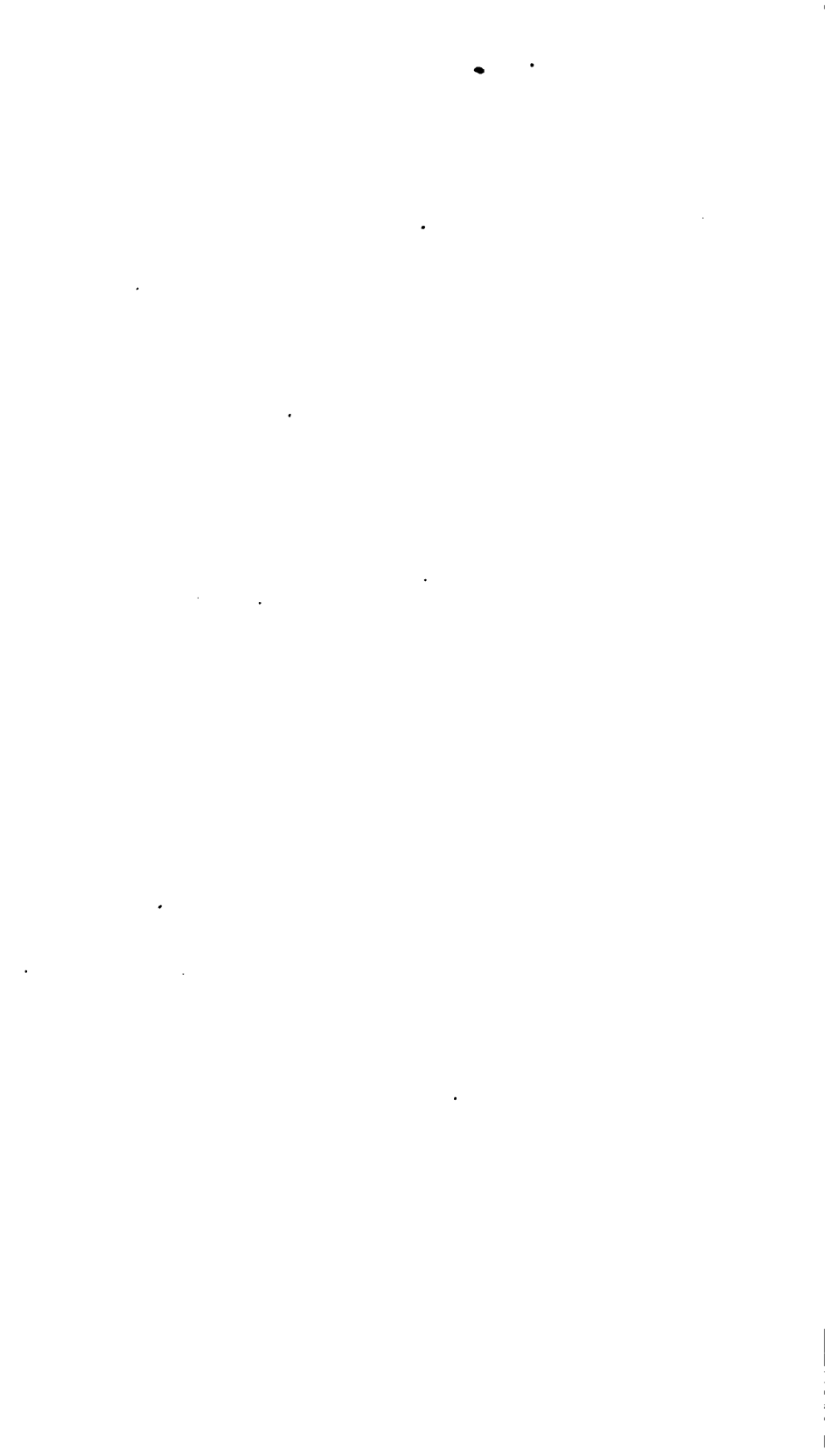
from many different countries—was to the effect that no medical department could have interfered less with the operations of the combatant force than did the Japanese. This was largely the result of having so organized that department that it was sufficient unto itself.

The sanitation of the Japanese army, as has been pointed out, was good. While the responsibility for recommendations rested upon the medical department, it must be recognized that their enforcement depended to a great extent on the line commanders and on the men themselves. The good health of the command as a whole was, therefore, largely dependent on the recognition of the importance of good hygiene to maintain the effectiveness of the army by officers and men generally. That they did recognize this may be mainly ascribed to their thorough practical education on sanitary matters. The responsibility imposed on higher commanders for the health of their forces was also a potent element in securing good hygiene. It should be noted, moreover, that the material of which the army was composed was excellent physically, as it was selected by the medical department only after rigid examination, and physically unfit men were promptly gotten rid of by the same department. The good health of the army, as a whole, was undoubtedly much promoted thereby.

While the Japanese utilized for sick and wounded soldiers a very large percentage of the medical skill available in their country, in any nation the competence of that skill must depend on the current medical teaching of the country in question. The medical officers in the Japanese army were not inferior professionally to their confreres in civil life; in fact, the reverse was true, but Japan does not afford practitioners of medicine and surgery with the thorough and practical training to be found in countries older in modern civilization, so that, while none of the surgeons in the army fell below a certain professional standard, that standard was not as high as was desirable. Even so, a very large percentage of men, after having been disabled to an extent which required their treatment at home in Japan, were returned to the ranks, which shows that, so far as maintaining the effectiveness of the army was concerned the medical depart-

ment did not do so badly. Little can be learned from the medical and surgical experience of the war; the necessity of a good first-aid packet, easy of effective application in unskilled but trained hands, was again emphasized.

The medical department of every army must, of course, be only part of a whole, and while that of the Japanese performed its duties well, its success must be ascribed in part to the line and to the other departments, which aided it by all means in their power, with no personal or departmental jealousies, their only anxiety being for the success of the army, with the best care practicable for its ill and injured soldiers.



APPENDIX NO. I.

REGULATIONS.

REGULATIONS FOR THE MEDICAL SERVICE OF THE JAPANESE ARMY IN TIME OF WAR.

1. The medical service is charged with the duty of looking after the health of the army and of caring for the sick and wounded. This will be held to include all matters which must be carried out in effecting the above-named purposes. Surgeons shall be under army discipline and command and will be held responsible for recommending necessary hygienic measures to the commanders of the units to which they are attached.

2. Soldiers of the Empire and military employees wounded or taken sick in war service will be cared for at government expense. This will not be held to apply when sick or wounded go to a city hospital of their own volition. In special cases even others than soldiers or military employees may be taken care of at government expense.

3. Sick and wounded of allies with the army and prisoners of war will be cared for at government expense; compensation for their care will afterwards be arranged with the foreign government concerned.

4. The personnel of the medical department shall be distinguished with a red cross on a white ground on the arm, and a red cross shall be put on all medical department supplies.

5. At field hospitals and at dressing stations the Red Cross flag with the national flag shall be hoisted. At night a red lantern will be used.

6. Sick and wounded of the enemy shall be cared for in accordance with the principles of the Geneva Convention. In case of the retreat of our army, if time does not allow

removal of sick and wounded, some medical personnel and medical supplies under the protection of the badge of neutrality shall be left with them, reliance being placed upon the protection of the Geneva Convention.

MEMBERS OF THE MEDICAL DEPARTMENT.

7. The surgeon captain, under the commander of the troops to which he is attached, will oversee the surgeons lieutenant and second lieutenant in the performance of their duties. The senior surgeon captain in each infantry regiment will supervise the medical service of the entire regiment.

8. Surgeons lieutenant and second lieutenant, under the commanders of their units, will assist the surgeons captain. In case a surgeon captain is not attached to a regiment they will perform his duties.

9. Apothecary officers, under the control of their commander, shall care for medical department supplies, shall prepare medicines, and oversee the chief nurses and other nurses in the performance of their duties. If necessary, they will make chemical analyses and shall always carefully care for apparatus and instruments, repairing them and exchanging those which are of no further use. They must also procure supplies locally.

10. Surgeons and apothecary surgeons shall receive directions from the proper chief surgeon.

11. The chief nurse shall perform his duties under the direction of the surgeons and apothecary officers, and shall superintend the other nurses. In the sanitary company and in the field hospital one of the chief nurses shall be engaged in clerical service for the chief surgeon or the chief of the hospital, as the case may be. The chief nurse will also assist in the preparation of medicines, will record the supplies consumed, and will oversee the men engaged in cleaning and repairing instruments and apparatus. When the sanitary company is divided, or a branch of the field hospital is established, a chief nurse may be employed in place of the apothecary officer under the direction of the surgeon.

12. Nurses will engage in caring for sick and wounded under the direction of their superiors, and will supervise the work of the assistant nurses.

13. Workmen will be employed to clean and repair the instruments and apparatus, and also to care for such instruments and apparatus in the operating room. If necessary, they will be required to pack supplies.

14. The medical department attached to regiments shall consist of surgeons, chief nurses, and other nurses; these will all be engaged in the medical service of the regiment. Besides these, in the infantry and artillery, when necessary, some privates who have been trained as litter bearers may be employed for carrying wounded. They are called assistant litter bearers.

MEDICAL SERVICE IN MARCH AND AT A HALT.

15. The medical service in march and at a halt is almost the same as in time of peace.

16. In march soldiers disabled on account of slight illness may be allowed to disarm and to wear sandals instead of shoes. They may also ride on a cart or horse. In case they will be long disabled they may be transferred to a military or other hospital. If they are transferred to a nonmilitary hospital, report of the fact shall be made to the commander of the nearest line of communication station.

17. While at a halt surgeons should be very careful in regard to the sanitary condition of the camping place, and should especially investigate in reference to the presence of epidemic diseases and to the condition of the water supply and report on these subjects to the commander.

18. While at a halt the surgeon on duty with troops will prepare a special room for the care of slightly disabled soldiers, who on the resumption of the march will be disposed of in accordance with paragraph 16. Medical officers attached to a unit may be ordered to serve in an immobilized field hospital (she-by oin).

SERVICES DURING A BATTLE.

19. During a battle surgeons will select a place sheltered from the enemy's fire, behind the firing line, for the first-aid station, and will direct the chief nurse and the nurses to col-

lect the wounded and to care for them. If necessary, a sign may be put up to mark this place, but care must be taken that it does not attract the fire of the enemy.

20. The medical personnel attached to a cavalry command about to attack the enemy will receive directions from the commander beforehand so that necessary preparations may be made for the relief of wounded. With the artillery the best position for a first-aid station should be selected near the artillery position, it being sheltered from the enemy's fire.

21. When a fight becomes more severe and a dressing station has not been opened or is too far away, the surgeon captain of an infantry command will establish a temporary dressing station for emergency cases and will attach the necessary medical personnel to it, leaving the others at the firing line. Preferably one temporary dressing station should be established for several near-by regiments.

22. Though the commander orders the opening of a temporary dressing station, the surgeon is authorized to recommend its establishment or to open it at once if there is not time to await the answer of the commander, afterwards reporting the fact to him.

23. At the temporary dressing station the commander will order the employment of the assistant litter bearers. The surgeon may, however, recommend that they be used if he consider it necessary. Assistant litter bearers will leave their guns and knapsacks at the station, will tie a red cloth around the right arm, and take litters and pouches and will then go on the firing line to be employed in carrying wounded. Necessary bandages shall be given to the assistant litter bearers by the nurses at the temporary dressing stations.

24. The assistant litter bearers have no protection under the Geneva Convention.

25. In the artillery the detail of assistant litter bearers will be made only by order of the commander.

26. The surgeons lieutenant and second lieutenant with troops shall direct the chief nurse and other nurses at the firing line and shall exercise care to separate slightly from seriously wounded, so that litters may be used properly.

27. The temporary dressing station must be located near the firing line in a good situation, sheltered from fire, where water may be conveniently obtained, and where it does not

interfere with the movements of the troops. In choosing its site special attention must be paid to any near-by artillery position. If necessary, the sign to show the way to the station may be put up.

28. At the temporary dressing station as much hay and straw as possible should be obtained, as should also carts and material for improvising litters. Blankets or mats on which the wounded may lie should be put on these.

29. Service of temporary dressing stations is almost identical with that of dressing stations. Measures which can not be carried out as at the dressing station will be regulated by the surgeon in charge.

30. Rations for the personnel of the temporary dressing stations and for the wounded will be obtained from the regiment to which they belong or from a near-by regiment. When blankets are required for wounded the regimental commander will be appealed to for the necessary directions.

31. Temporary dressing stations will be abandoned on the arrival of the sanitary company. The surgeons will then assist at the dressing station, and the other medical personnel and the assistant litter bearers will rejoin their units. The medical and surgical materiel and the pack horses shall return to the light-baggage train. Even after the sanitary company has arrived temporary dressing stations may be continued in operation when required by the terrain of the battlefield.

IDENTIFICATION.

32. An identification tag is worn by each officer, soldier, and employee for the purpose of identifying him if he be killed or wounded. Medical officers, chief nurses, and nurses will enter in the diary of casualties the names of the killed and of the wounded. With the killed and with those wounded who are unable to tell their names, these will be obtained from the military ledger (pocketbook), from the mark on the coat, or from the identification tag. The identification tag must never be removed from the body.

INFRACTIONS OF DISCIPLINE.

33. In cases of infraction of law or discipline, if the offense fall under the criminal law, the Inspector-General of Field Sanitation, the chief surgeon of an army, the surgeon in

charge of a hospital, the commander of a sanitary company, or other chief medical officer of a detached unit will examine into the case and present it to the chief of the proper department. Other offenses may be punished by the commander.

INSPECTOR-GENERAL OF FIELD SANITATION.

34. The Inspector-General of Field Sanitation under command of the General Inspector of the lines of communication, will superintend the medical service in the field.

35. The Inspector-General of Field Sanitation will have communication with the War Department in order that he may execute his duties exactly and expeditiously, and has authority to recommend any necessary measures to the above-named department.

36. The Inspector-General of Field Sanitation must always keep in touch with the general headquarters of the lines of communication and the general headquarters of communication and transportation, so as to arrange for the receipt of sick and wounded, for their transport, for the proper distribution of the medical personnel, and for the maintenance of sufficient medical supplies.

37. The Inspector-General of Field Sanitation has authority to give commands to the chief of the relief section of the Red Cross Association.

38. The Inspector-General of Field Sanitation will make rules in regard to medical attendance for Imperial headquarters.

39. The Inspector-General of Field Sanitation will examine the reports and letters from the army chief surgeons and the chief surgeon of the lines of communication. Those which will be useful to the Medical Bureau of the War Department will be sent there, and others will be forwarded to the Inspector-General of the lines of communication.

ARMY CHIEF SURGEON.

40. The army chief surgeon, under the control of the commander in chief of the army, will superintend the medical service of the army. He will receive the directions of the Inspector-General of Field Sanitation in regard to the furnishing of medical officers and on other medical matters.

41. An army chief surgeon has the right to know every order issued by the army commander, so that he may make necessary previous arrangements to meet the objects of the operation.

42. An army chief surgeon will consult with the chief of staff of the army, and through his assistance will procure men, horses, supplies, and camps needed for the wounded.

43. An army chief surgeon will always keep in communication with the division chief surgeons and with the chief surgeon of the lines of communication and will arrange for the transport of wounded so as not to hamper military operations.

44. When an army chief surgeon finds it necessary to use a field hospital on the lines of communication, judging that no harm can result to the army from such use, he may represent this to the commander in chief of the army, and the order of the commander in chief will temporarily bring the field hospital under the control of the commander of the lines of communication.

45. The army chief surgeon is authorized to command the committees of the Red Cross Association, but when they are transferred to the lines of communication he can not give orders directly to them.

46. The army chief surgeon will examine the reports and letters from the division chief surgeons and from the chief surgeon of the lines of communication. Those which will be of use to the Inspector-General of Field Sanitation will be sent to him and others will be forwarded to the commander of the army.

47. When communication is interrupted between the medical department of an army and the office of the Inspector-General of Field Sanitation, the army chief surgeon will execute the duties of the Inspector-General of Field Sanitation. When communication is restored the army chief surgeon will report to the Inspector-General of Field Sanitation in reference to the services which have been performed.

48. The army chief surgeon will establish proper rules for the medical attendance to the headquarters of the army.

49. After demobilization the army chief surgeon will make a minute report, which will be forwarded to the Chief of the Medical Bureau of the War Department.

DIVISION CHIEF SURGEON.

50. The division chief surgeon, under command of the division commander, will superintend the medical service of the division. He will also receive the directions of his army chief surgeon in regard to medical personnel and other medical matters.

51. The division chief surgeon has a right to know every order issued by the division commander so that he may make necessary previous arrangements to meet the objects of the operation.

52. The division chief surgeon shall supervise the sanitation during the march or at a halt, and must be especially careful to prevent epidemic diseases.

53. In case there is no military hospital opened nor other hospital available and no means to transfer sick and wounded on account of interruption of communication, the division chief surgeon will recommend the establishment of a temporary hospital to the division commander. For this he may use the personnel of a field hospital and its supplies. In order to free it for an advance it will be replaced by personnel and supplies from the lines of communication as quickly as possible.

54. When the division chief surgeon wishes to open a "quartering" hospital (shei-byoin) on account of a prolonged halt he will recommend this to the division commander and will make the necessary arrangements through the assistance of the chief of staff of the division. The procedure will be the same for the establishment of an isolation hospital. The isolation hospital must, however, be one part of the "quartering" hospital. The personnel and supplies of the "quartering" hospital will be taken from a field hospital, and, if necessary, the medical personnel of other units may be called in to assist, but when the division again marches this personnel must be replaced from the lines of communication.

55. Before a battle begins the division chief surgeon will consult with the chief of staff and will designate the field hospitals which can soonest be brought on the ground. He will also state his opinion to the division commander as to

what commands should be given to the medical personnel. However, when there is not time to wait for the orders of the division commander he may himself at once give the necessary orders to the field medical personnel. This should afterwards be reported to the division commander.

56. When the division chief surgeon expects a great battle he will consult with the chief of staff so that he may procure men and material for transporting sick and wounded and thus assist the sanitary company.

57. The division chief surgeon shall report the opening and closing of the field hospitals and their location to the army chief surgeon and, if necessary, to the chief surgeon of the lines of communication.

58. The division chief surgeon may, with the permission of the division commander, use the personnel of the sanitary company and the field hospitals not engaged to assist those engaged.

59. The division chief surgeon shall use care to keep sufficient medical supplies on hand and shall be held responsible for their economical use. When necessary, quick methods must be taken to replenish them before all are exhausted.

60. After every battle the division chief surgeon shall report to the division commander and to the army chief surgeon in accordance with articles 101 and 127 (Service of Higher Commanding Headquarters).

61. The division chief surgeon will examine the reports, letters, and applications from field sanitary organizations and regimental and other sanitary detachments. Those of use to the army chief surgeon will be forwarded to him and others to the division commander.

62. When communication is interrupted between the offices of the division and army chief surgeons the division chief surgeon will execute the duties of the army chief surgeon, afterwards reporting to the army chief surgeon in respect to any action which he may have taken.

63. Division chief surgeons will make provision for the medical attendance of division headquarters.

64. The chief surgeon of an independent division has the rights and duties of an army chief surgeon in addition to those already mentioned in this chapter.

65. At the end of a war each division chief surgeon will make a minute report to the Chief of the Medical Bureau of the War Department.

SANITARY COMPANY.

66. The duty of the sanitary company is to open the dressing station at the rear of the firing line, and to collect and transfer wounded to the rear after giving them treatment. Under some circumstances the sanitary company may be ordered to assist in the work of a field hospital.

67. The sanitary company will be under the command of the division commander, but will also receive the orders of the division chief surgeon in respect to the service of the medical department.

68. The sanitary company must move promptly with the fighting troops. When conditions at the dressing station do not permit it to march with the troops, the part necessary to care for the wounded until a field hospital arrives will remain.

69. The sanitary company consists of the principal part and of two litter companies. The principal part cares for the matériel of the company. Forage is carried for the horses, as are also rations, not only sufficient in amount for the personnel of the company, but enough for 100 wounded also.

70. The sanitary company will bear the name of the division to which it belongs. The litter companies will be named the first and second. When a sanitary company is divided into two halves, that part to which the senior officer belongs will be called the first half and the other the second half.

71. One litter company may be divided into two sections, each section may be divided into two half sections, and each half section may be divided into two parts.

PRINCIPAL PART OF THE SANITARY COMPANY.

72. The officer commanding the sanitary company is under the command of the division commander, also receiving the directions of the train battalion commander, and is responsible for the proper performance of duty by his subordinates. He will also receive the directions of the division chief sur-

geon in regard to medical personnel, medical service, and medical and surgical matériel.

73. The commander of the sanitary company when ordered to have the dressing station opened will consult with the chief surgeon of the company, and select a good situation for it. The chief surgeon will then open the station, while the company commander will be responsible for collecting the wounded and carrying them to the rear. In case it is necessary to open a dressing station, before being ordered to do so, the company commander will consult with the chief surgeon of the company and may then open it. In this case report of the fact will be made as quickly as possible to the division commander.

74. The commander of a sanitary company will compel his subordinates to obey the terms of the Geneva Convention so as not to forfeit their rights to the benefits of neutrality.

75. When the commander of the sanitary company is absent the senior company commander will take his place, and then has the rights of command of the chief of the sanitary company. When the sanitary company is divided into two parts, each company commander has the right to command his own half, just as the commander of the sanitary company has the whole when undivided.

76. The chief surgeon of the sanitary company will command the medical personnel under him and is responsible for properly carrying out the work of the dressing station. He is also authorized to command medical personnel who come temporarily to assist from other commands.

77. The chief surgeon of a sanitary company will, previous to battle, assign his subordinates to special duties, and will instruct them in the proper performance of the duties to which they are so assigned, especially in reference to receiving sick and wounded, to sending them to the rear, also to arranging medical and surgical matériel and to expending it. Their movements must be quick and expert.

78. The chief surgeon of a sanitary company will command every department of the dressing station while it is open and will himself be responsible for the seriously wounded department. He will also instruct his subordinates to assist in the busier departments.

79. When the chief surgeon of the sanitary company is absent the senior surgeon present will take his place. When the sanitary company is divided into two parts the second half will be commanded by the senior medical officer present, he performing the duties of the chief surgeon when undivided.

PERSONNEL OF THE LITTER COMPANIES.

80. The officer in command of a litter company shall direct his subordinates and shall be held responsible for properly carrying out all services in connection with the transportation of sick and wounded.

81. The work of transporting sick and wounded will be under direction of the commander of the sanitary company or of its chief surgeon.

82. Section leaders will command their sections and will be held responsible for the quickest possible collection and transportation of wounded.

83. Though the route and the distribution of the sections are regulated by the orders of the officer in command of the litter company, the section leader can, if necessary, change them so as to take the shortest route to the temporary dressing station or to the first-aid station. The section commander will command the squad commander and will allow the men under the latter during the performance of their duties to receive the instructions of the medical personnel, and, moreover, will try not to lose touch with this medical personnel.

DRESSING STATION.

84. The dressing station will engage in giving necessary treatment to wounded who are brought from the firing line and will then transfer them to the rear as quickly as possible. The station must be quickly opened and closed so that it may march with the advancing troops or may retreat with those retiring.

85. The location of the dressing station will, if possible, be within 1,000 meters of the firing line, in a convenient place, with ample space for the collection and evacuation of sick and wounded. It should be sheltered from the enemy's fire, but not hidden so as not to be easily found. The best loca-

tion is near water and, moreover, shelter should be afforded from rain, snow, heat, or cold.

86. At the dressing station as much straw and hay as possible should be collected. In emergencies carts should be employed to transport wounded and improvised litters should be utilized. Blankets or mats should be placed on these.

87. A dressing station has four departments, as follows: (1) Receiving and forwarding department; (2) seriously wounded department; (3) slightly wounded department; (4) department for the preparation of medicines. Colored signboards will be put up at these departments, as follows: Blue for 1, white for 2, red for 3, black for 4.

88. The receiving and forwarding department will be divided into two, as follows: 1. Receiving section, where the wounded will be brought and examined to distinguish the serious from the slight cases, so that they may be forwarded to the proper departments. Serious cases will be disposed of first. When it is recognized that no treatment is required a diagnosis tag will be put on and the man will be transferred to the forwarding section. 2. Forwarding section, from which wounded will be forwarded as follows: *a.* Those who are wounded slightly and able to walk a long distance will be assembled and will be conducted by the soldier of the highest rank among them to the department for transporting patients or to the nearest hospital on the lines of communication. *b.* Wounded not mentioned in *a* are divided into two classes: 1, on foot; 2, by litter. Both will be given to the litter company in charge of transporting wounded to the rear and will be taken to different field hospitals; but with those able to walk the highest ranking soldier among the wounded will be put in charge. A list will be made of the money and valuable property of senseless wounded in the receiving department, which will be delivered with the property to the intendance sergeant, who will list them according to Form 3 and will keep them carefully. When the intendance department is about to hand over the money and valuables to the man who is to take charge of the evacuation of such wounded, the book in which the name of the goods, the number of pieces, the number of the list, and the name and rank of the wounded man are entered, shall be presented and the signature of the receiver asked for. The arms and ac-

couterments will be delivered also. A list of the wounded will be made at the receiving and forwarding department. The personnel of this department will be one surgeon-captain, one lieutenant or second lieutenant surgeon, some chief nurses and other nurses.

89. At the seriously wounded department emergency treatment will be given, a diagnosis tag will be put on, and then transfer will be made to the forwarding section. The personnel of this department will be the chief surgeon, one surgeon-captain, two lieutenant surgeons or second lieutenant surgeons, some chief nurses, and other nurses.

90. At the slightly wounded department dressings will be applied, diagnosis tags will be put on, and then transfer will be made to the forwarding section. The personnel of this department will be three lieutenant surgeons or second lieutenant surgeons, some chief nurses, and nurses.

91. At the department for preparing medicines the medical chests will be opened and the necessary supplies taken from them. The personnel of this department will be one apothecary officer, a chief nurse, and some nurses.

WORK OF THE LITTER COMPANY.

92. The business of the litter company is to search for wounded and to carry them to the rear. Its services are performed under two heads, advanced service and rear service. The former attends the firing line and carries wounded to the dressing station, and the latter transfers wounded from dressing stations to field hospitals.

93. The advance service will begin as soon as the operations of the sanitary company have been ordered started, while the service at the rear customarily awaits the time when the advance service is not so much occupied.

94. When carrying wounded from the firing line to the dressing station it may be arranged so that bearers are changed on the way. This will depend on the distance, nature of the ground, and the character of the fight. Even the use of carts is allowable, but no unnecessary time must be spent in exchanging from bearers to carts. When the location of the dressing station is hidden or the way is difficult to find, a sign to point its direction will be put up.

95. When assistant litter bearers are employed their knapsacks will be left at the dressing station and one litter and pouch will be given to each four. This litter will be obtained from the litter company, and must be brought back to it after the assistant litter bearers have finished their work.

96. One litter party consists of four men, but when the work is very heavy three or even two may be employed. Then extra men are ordered to attend those wounded who can walk and to transport those requiring it by hand or by improvised litters.

97. The litter parties on advance service must go quickly to the firing line to search for the wounded, giving them emergency treatment if necessary (or they may receive their first treatment at the first-aid station), and then bring them to the dressing station. The ammunition of wounded will be given to other combatants, but their arms and accouterments will be carried back with them. If wounded can walk they will carry their own arms and accouterments if possible. The rifle will be examined so that if necessary it may be unloaded.

98. Even when a wounded man appears to have died while being transported, yet he must be carefully carried to the dressing station. At the firing line, when the bearers can not determine whether a wounded man be living or dead, they must wait until a decision is made by a member of the medical personnel.

99. The litter company will sometimes be ordered for temporary duty in a field hospital or for duty at the rear.

DIAGNOSIS TAGS.

100. Diagnosis tags must be put on all wounded; the white shows a serious wound and the red a slight one. On the tag a general description of the treatment given at the dressing station will be noted, and directions as to the method of carrying will be given. For procedure in case a wounded man can not give his name, see paragraph 32.

REPORTS.

101. After each battle a report on the service of the dressing station will be prepared by the chief surgeon of the dressing station and a report on each litter company by its

company commander. These will be sent to the commander of the sanitary company, who will indorse his opinion on them and forward them to the division chief surgeon. The items of the reports will be as follows, but a brief report of casualties must be made in addition immediately after the battle:

a Work of the dressing station: (1) Date, weather, time of opening and closing and name of place and its location (giving a map). (2) Whether the whole sanitary company was employed or only half of it. (3) Number and regimental designation of the wounded cared for. In all cases of commissioned officers wounded, the rank, kind of wound, and full name will be given. But with noncommissioned officers and privates, this will be done only in case they are killed. (4) Number of those to whom treatment was given and a record of operations performed, specifying their character. (5) Amount of medical supplies used and amount received. (6) Rank and name of the surgeon in charge of each department of the dressing station, including those who came to assist from other units.

b Work of a litter company: (1) Date, weather, time of starting and finishing duties and name of place. (2) Distance wounded were carried and how well bearers performed their duties. (3) Total number of wounded cared for, distinguishing the number of those who could walk from those whom it was necessary to carry by litter. (4) Quantity of medical supplies used.

FIELD HOSPITAL.

102. The principal function of the field hospital is to receive wounded from the firing line and the dressing station, and after necessary treatment to transfer them to the rear.

103. The movements of the field hospital and its opening and closing are regulated by the order of the division commander, but the division chief surgeon has authority to command it with respect to the medical service.

104. When a field hospital is used in the lines of communication it will receive its orders from the commander and the chief surgeon of the lines of communication. A field hospital must have personnel sufficient to care for 200 wounded, and

in addition to forage and to rations for the personnel, must also carry rations for sick and wounded. If necessary, a field hospital may be divided into two, so that each half can carry on its business independently.

106. A field hospital will bear the name of the division to which it belongs. When it is divided in two that part where the hospital director is stationed will be called the first division and the other the second.

107. The field hospital director is under the command of the division commander, also receiving the directions of the train battalion commander, and is responsible for the proper performance of duties by his subordinates. The division chief surgeon may command him in respect to the medical personnel, its service, and the surgical and medical materiel. The field hospital director will also maintain communication with the department for transporting patients and the nearest station on the lines of communication, so that transportation of wounded may be carried on as quickly as possible.

108. The field hospital director will make a proper distribution of duties to his subordinates, but will himself attend serious cases.

109. If necessary, the field hospital director will cause the intendance officer to procure horses, carts, and coolies for the transportation of wounded. If the intendance officer is unable to obtain them, application for instructions should be made to the division chief surgeon.

110. When the field hospital director is absent the senior surgeon present will take his place. When the hospital is divided into two parts the surgeon-captain in charge of the second half is authorized to execute the duties of the director for his own half.

111. When a temporary hospital is established in march in accordance with paragraph 53, or when a "quartering" hospital is established at a halt in accordance with paragraph 54, the personnel and supplies of a field hospital will be utilized for them.

112. The "quartering" hospital and the temporary hospital will bear the name of the place where they are opened. For either, dwelling houses or a hospital, if there be one, will be used. At the entrance of a town where either of the above-

named hospitals has been opened a notice will be posted on the notice board at the station or a sign to point the way will be erected.

113. Sick or wounded at these hospitals who do not appear likely to recover soon will be transferred to the rear by the assistance of the department for transporting patients or of the station on the lines of communication.

114. The regulations for the "quartering" hospitals will be those prescribed for military hospitals.

115. When a division marches the personnel in the "quartering" hospital can not advance until it is replaced. Paragraphs 122 and 123 will apply in exchanging either the "quartering" hospital or the temporary hospital.

OPENING A FIELD HOSPITAL.

116. When the command to open a field hospital is given the hospital director must establish it at once and so report to the sanitary company and to the division medical department.

117. A field hospital is preferably located in a place near a dressing station; it must also be convenient for the transportation of wounded and to water. It is still better if it can be placed near a railway or a navigable stream. If a field hospital be so located as to be hidden from view or where a wrong road may easily be taken, a pointer will be put up to indicate its position.

118. If in the place where the field hospital is to be established there be a hospital or other proper buildings they shall be utilized. In case houses are used a large one should be taken so that the wounded need not be separated. When a field hospital is opened as much hay, straw, mats, carpets, etc., as possible should be obtained. An attempt should be made to gather together materials for transportation of sick and wounded.

119. In a field hospital the following rooms will be established: 1, main part; 2, receiving and forwarding department; 3, wards for wounded and sick. (An attempt should be made to separate the different kinds of sick and wounded.) 4, operation room; 5, dispensary; 6, disinfecting room; 7, kitchen; 8, bathroom; 9, mortuary; 10, stables; 11, shelter for carts.

120. The field hospital shall always be ready to open or close at any time, so as to move with the advance of the division or with its retreat.

121. The field hospital must soon be replaced by the Sanitary Reserve Personnel, but in case the whole of a field hospital can not be moved this should be reported to the division chief surgeon and its half may take the advance. Great care must be taken in making an exchange that wounded are not neglected.

122. On the arrival of the Sanitary Reserve Personnel the daily histories of sick and wounded, the prescription book, and other important papers shall be transferred and a receipt obtained. In this case, if possible, the presence as a witness of the senior medical officer under the chief surgeon of the lines of communication is required.

123. Clothes, beds, and other medical supplies in use will be left to the successors and other articles of the same kind obtained from them. The list of arms and accouterments of the wounded and their valuable property, with list, will also be transferred and a receipt obtained.

124. On the advance of a division if the Sanitary Reserve Personnel has not arrived and communication with the division headquarters is either broken or uncertain the field hospital director will report at once for orders to the commander of the lines of communication. In this case the latter officer will report to army headquarters and division headquarters so that arrangements may be made to have the Sanitary Reserve Personnel come at once.

125. When the field hospital has been replaced by the Sanitary Reserve Personnel the senior surgeons of each shall sign their names together to reports to division and line of communication chief surgeons.

126. On retreat of the division the field hospital should march at its head. If this interfere with the movements of the division on account of the necessity of carrying the wounded a different road should be taken.

REPORT OF THE FIELD HOSPITAL.

127. A report of the field hospital shall be forwarded to the division chief surgeon from its director when it is closed or when it is replaced by a successor. With this report will

be sent the book in which operations are recorded. This report is in addition to the report of casualties immediately after a battle. The items of the detailed report are as follows: 1. Date of opening and closing, weather, name of place, locality, and character of buildings (giving a map). 2. Number and regimental designation of wounded, kinds of wounds. The rank and full name of commissioned officers wounded shall be noted, and the same will be done in the case of noncommissioned officers and privates killed. 3. Conditions under which wounded have been cared for. 4. Conditions under which wounded were transferred to the rear. 5. Conditions under which the hospital was closed and replaced by a successor. 6. Quantity of supplies consumed and replaced. 7. Food of wounded. 8. Rank and names of the surgeons engaged in the service of the hospital, including those temporarily attached from other units (only the number of noncommissioned officers and privates will be given). 9. Other pertinent facts.

MEDICAL SERVICE ON THE LINES OF COMMUNICATION.

128. The chief surgeon of the lines of communication under the control of the commander superintends the medical service of the lines of communication. He receives the directions of the army chief surgeon in regard to the medical service. In respect to transportation of sick and wounded and in respect to the employment of the Japanese Red Cross Association relief company, he will also receive directions from the Inspector-General of Field Sanitation. He should always be in direct communication with the division chief surgeons in order that he may execute his duties properly.

129. The chief surgeon of the lines of communication is authorized to superintend and direct all the medical personnel who are engaged on the lines of communication, but he can not absolutely command the personnel of the field hospitals temporarily so engaged.

130. The chief surgeon of the lines of communication will attempt to have the Sanitary Reserve Personnel replace field hospitals as promptly as possible and to establish stationary hospitals.

131. The chief surgeon on the lines of communication will first make a good plan for transporting wounded and will

require the department for transporting patients to make necessary preparations for rapid transportation.

132. In case vacancies occur in the medical personnel of the lines of communication the chief surgeon of the lines of communication is authorized to hire doctors, apothecaries, and nurses in the towns.

133. The chief surgeon of the lines of communication must always be careful in regard to medical supplies, must know the amounts that are stored in the sanitary reserve storehouse, and must order sufficient amounts from this storehouse to meet the needs of troops and hospitals. If the sanitary reserve storehouse need extra men, horses, carts, or boats, etc., for transporting medical supplies the chief of staff of the lines of communication shall be consulted in order that they may be obtained.

134. The chief surgeon of the lines of communication must report to the army chief surgeon, to the division chief surgeons, and to other departments concerned the locations of the sanitary reserve storehouse, the department for transporting patients, and the Sanitary Reserve Personnel. A report will also be made when a field hospital is located on the lines of communication or when it is returned to the advance.

135. The chief surgeon of the lines of communication will examine the letters and reports from the various medical organizations and forward them to the Inspector General of Field Sanitation, to the army chief surgeon, or to the commander of the lines of communication, as may be appropriate.

136. The senior medical officer on the lines of communication after the chief surgeon of the lines of communication will receive the directions of the latter to visit the posts on the lines of communication for the purpose of investigating their sanitary conditions and to give information in regard to the transport of sick and wounded. He will also not fail to replace field hospitals with the Sanitary Reserve Personnel whenever opportunity offers. In the latter case he will be present as a witness of the transfer.

137. The chief surgeon of the lines of communication shall take proper measures to supply medical attendance to the headquarters of the lines of communication.

138. The chief surgeon of the lines of communication shall make a minute official report to the chief of the Medical Bureau of the War Department at the conclusion of the war.

139. Stations on the lines of communication shall establish temporary hospitals at necessary points for sick or wounded who are carried through such places. Such temporary hospitals will be attached to the line of communication hospital.

140. Posts on the lines of communication will supply proper materials for transportation of sick and wounded.

141. Commanders of posts on the lines of communication may apply for medical personnel when necessary to the commander of the lines of communication.

LINE OF COMMUNICATION HOSPITALS.

142. A line of communication hospital will be established in order to take care of the sick of troops passing through and also to care for sick and wounded in the line of communication district, and of sick and wounded who can not bear transportation to the rear.

143. In case it is necessary to establish a line of communication hospital the chief surgeon of the lines of communication will propose it to the commander and will also consult with the post commanders in reference to its personnel and supplies. In the line of communication hospital will be employed the medical personnel attached to the post and measures shall also be taken to employ the personnel of the Red Cross Association relief company or the civilian doctors of the district. The director of the hospital must be a military surgeon. In the line of communication hospital the Sanitary Reserve Personnel and the personnel of the department for transporting patients may be called upon to assist.

144. The regulations for field hospitals will apply in the line of communication hospital, and the chief surgeon of the lines of communication will give necessary directions in regard to the medical service of the hospital. In reference to military discipline and supply directions of the post commanders will be received.

SANITARY RESERVE PERSONNEL.

145. The Sanitary Reserve Personnel is utilized for establishing stationary hospitals. In addition to the medical personnel it includes certain necessary employees and matériel.

146. The Sanitary Reserve Personnel may be ordered to assist the line of communication hospital or the department for transporting patients.

147. The chief of the Sanitary Reserve Personnel is under the command of the commander of the lines of communication, but also receives the directions of the chief surgeon of the lines of communication in regard to medical matters.

148. The Sanitary Reserve Personnel is usually divided into three, but when necessary smaller subdivisions may be made. The senior surgeon is authorized to exercise the duties of chief to one part.

149. The Sanitary Reserve Personnel, while not engaged, will have its location fixed by the commander of the lines of communication. It should be located in the advanced part of the lines of communication.

150. When the Sanitary Reserve Personnel replaces a field hospital and request is made for the replacement of matériel left behind, it will be supplied.

STATIONARY HOSPITALS.

151. When a field hospital is closed the stationary hospital will be opened by the Sanitary Reserve Personnel, and it will be called by the name of the place where it is located.

152. When a stationary hospital has been established its director will report the fact to the chief surgeon of the lines of communication, with a table showing the personnel. When more personnel is required the director will make application, giving a statement of the circumstances.

153. Stationary hospitals must be kept open until all wounded have been transferred to the rear. In case it is necessary to enlarge a hospital or to change its location the director will propose exactly what he wishes to do to the chief surgeon of the lines of communication.

154. For regulations governing stationary hospitals, see paragraph 144.

SANITARY RESERVE STOREHOUSE.

155. The function of the sanitary reserve storehouse is to supply sufficient stores for troops in the advance and for the lines of communication; and also to forward clothes for the sick and wounded.

156. The sanitary reserve storehouse is made up of the necessary number of men, horses, and matériel for caring for reserve medical supplies and for their transportation. (See Appendix IV.)

157. The superintendent of the sanitary reserve storehouse, under command of the commander of the lines of communication, is held responsible for the proper performance of duties by his subordinates. He will receive the directions of the chief surgeon of the lines of communication in respect to the medical service.

158. The superintendent must always be careful to see that the apothecary officers execute their duties as quickly as possible.

159. The apothecary officer, under command of the superintendent, cares for the medical supplies and the clothing for the wounded, recording their issue and receipt. He must always hold himself in readiness to send what is ordered for the various troops.

160. The location of the sanitary reserve storehouse must be in the principal post of the lines of communication or at a very convenient point in its vicinity. When the distance between the reserve storehouse and the advance troops is too great the main part of the storehouse should be removed to a better post in the lines of communication. It is especially necessary that such an arrangement be made when it is expected that the advance troops will need a large quantity of supplies.

161. If one part of the army is at some distance from the main body, army headquarters will order that a sanitary reserve storehouse, or part of one, be attached to it.

162. When one part of a sanitary reserve storehouse is sent it is then called a branch of such a division sanitary reserve storehouse, and the commander of the lines of communication will specially dispatch the men, horses, carts, etc., necessary for it.

163. Medical supplies must be forwarded by boats, carts, and other rapid means. This provision must be specially observed for the troops in advance.

164. Great care must be taken to pack medical supplies so that they may not be broken or destroyed enroute, but near-by troops must, if possible, bring boxes or other containers to carry away what they require.

165. Coolies, carts or boats needed for forwarding supplies will be obtained on application to the chief surgeon of the lines of communication or directly to the post commander on the lines of communication.

SECOND RESERVE STOREHOUSE.

166. In the second reserve storehouse the forwarding of the reserve sanitary supplies kept there and distribution of the presents of the people to the wounded will be managed under the orders and direction of the Inspector-General of Field Sanitation.

DEPARTMENT FOR TRANSPORTING PATIENTS.

167. The function of the department for transporting patients is the transfer of sick and wounded on the lines of communication to the rear.

168. The department for transporting patients will provide resting places for the wounded.

169. The department for transporting patients consists of a superintendent and the necessary medical personnel and matériel.

170. The superintendent is under control of the commander of the lines of communication and is held responsible for the direction of his subordinates. He also receives the directions of the chief surgeon of the lines of communication in reference to the medical service.

171. The surgeon is under control of the superintendent; he will take proper measures for protecting the wounded and will assist in plans for their transportation.

172. The location of the department for transporting patients will be selected by the commander of the lines of communication in a convenient place for communication where

men, horses, and other transportation materials are easily collected. At the advance of the army the commander of the lines of communication will order that either the whole or part of the department for transporting patients advance to a proper place. After the battle begins many wounded may collect in an unexpected situation, in which case the superintendent will send one part of the department there in order that they may begin to perform their duties. This will then be reported to the commander of the lines of communication with a statement of the circumstances. When the location of the department for transporting patients is fixed, the superintendent will consult as quickly as possible with the post commander of the lines of communication, and a resting place for sick and wounded will be established. If it is necessary to open a line of communication hospital report of the fact will be made to the chief surgeon of the lines of communication.

173. The rest station will be provided with clean water, stimulants, and dressings. If necessary, rations and beds will also be furnished. In cold weather preparations must be made for fires.

174. The superintendent will consult with the line of communication post commander in reference to obtaining men, animals, boats, carts, and other means for transporting sick and wounded, and also to arrange the method of transportation. In road transportation he must communicate with the staff of a line of communication post; when by rail, the staff of the railroad commander; in water transportation, with the staff of the port commander.

175. When the department for transporting patients has begun its duties this will be reported to the chief surgeon of the lines of communication, to the division chief surgeons, and also to the field hospitals if possible.

176. At the receiving section of the department for transporting patients wounded brought from the front will be examined carefully and those who can bear transportation will be taken to the rear, and those seriously wounded who can not bear transportation will be taken to the line of communication hospital.

177. The medical personnel of the department for transporting patients will be engaged in the resting place. As far as they are available, they will also be employed in the line of communication hospital near by. But they will not be used for railroad transportation or water transportation. They may be employed also in the temporary hospital of the department for transporting patients.

178. In land transportation, if the men whose duty it is to accompany wounded are not sufficient in number, application will be made to the commander of the lines of communication, so that some of the personnel of the Red Cross Company may be detailed for this duty. If the distance is but a short one, application will be made for the employment of some of the personnel of stationery hospitals.

179. Vehicles required for carrying the wounded are preferably obtained in the towns, if these are not sufficient in number application will be made to the commander of the lines of communication for directions.

RAILWAY TRANSPORTATION OF SICK AND WOUNDED.

180. Railway transportation will be performed by hospital trains or trains for wounded that are specially provided.

181. Hospital trains and trains for the wounded will be furnished with the necessary personnel and supplies. The Inspector-General of Field Sanitation will fix the number of men and the kind, quantity, distribution, and method of replenishing the supplies.

182. The medical personnel engaged in hospital trains and trains for the wounded will be as follows: Two to three surgeons for 100 wounded; ten to twenty nurses to 100 wounded, in addition to one chief surgeon. The above personnel will be from a Red Cross relief company and civilian employees, but the chief must be a military surgeon.

183. The chief surgeon must direct the medical personnel under him and will himself attend serious cases and transact all business in regard to the medical service during transportation.

184. The chief surgeon will also execute the duties of transportation commander to his train.

185. The other surgeons will be engaged under direction of the chief and will attend to the treatment and care of the wounded, keep order in the train, and oversee the nurses.

186. The nurses will be engaged under the directions of the surgeons, assisting in the treatment, and will give food to the wounded, police the train, and, if necessary, attend to its disinfection.

187. The chief surgeon, after a trip, will report to the Inspector-General of Field Sanitation. This report will comprise the following points: 1. Condition and method of supply of sick and wounded during transportation. 2. Remarks on the medical service and a statement as to the expenditure of medical and surgical materials. (See Appendix V.)

188. If wounded are only in small numbers, not more than enough to fill one or two cars, they may be carried on a military or common train. In this case application will be made for using a military train or part of a common train, and the cars will be properly prepared by the hospital attendants.

189. When wounded must be transported by the railway through the field of operations, a consultation will be held between the chiefs of the medical and railway departments, and the method outlined in the preceding article will be followed.

HOSPITAL TRAINS.

190. Hospital trains are especially constructed for the use of the wounded, or common railway cars are properly equipped with the necessary constructions. Such trains are only used for transporting wounded, and are under the control of the Inspector-General of Field Sanitation. The director-general of communications and transportation will be consulted in regard to their movements.

191. Hospital trains will consist of cars for the wounded, those for the personnel, for a dispensary, for a kitchen, for supplies, and certain other cars. The number of cars will be determined by the Inspector-General of Field Sanitation, in consultation with the director-general of transportation and communications, in accordance with the condition of the track. The cars for isolation and for a mortuary will be separated from those for the wounded.

192. Cars of a hospital train shall be distinguished with a red cross on a white ground of about one shaku on the center of the sides of each car.

193. Hospital trains will be principally used for transporting serious cases and cases of epidemic diseases if there be any such.

194. Hospital trains will be provided with supplies for the wounded during the trip, and the post commanders of the lines of communication will furnish them with these, but if necessary supplies may be obtained from the supply station.

195. When a hospital train reaches its destination its duty is over and its chief surgeon will then forward to the inspector-General of Field Sanitation the required report, with a daily record of the wounded.

TRAINS FOR WOUNDED (TEMPORARY).

196. Temporary trains for wounded are prepared from common railway cars for single trips. They will be prepared by the nearest railway military headquarters, when the hospital or the department for transporting patients applies for them.

197. Temporary trains for wounded will be properly made up, depending on the number of wounded and condition of the track.

198. Temporary trains are only used for slightly sick and wounded who can sit up, and cases of epidemic diseases and insane must not be transported. These trains have no space for beds, and so if it is necessary to transport sick and wounded who must be carried lying, beds will be made in a freight car.

199. Applications for temporary trains will state the number and rank of the wounded, the points where they will be embarked and disembarked, the kinds of rations needed, etc.

200. The regulations for military trains will apply to the general administration of these temporary trains.

WATER TRANSPORTATION.

201. A hospital ship will usually be employed for the transportation of sick and wounded.

202. Hospital ships are either especially constructed for wounded or common ships are specially equipped. The

necessary medical personnel and supplies shall be provided for them. When a common ship is used the medical personnel appointed to embark will make the arrangements for the medical service of the ship, and will be held responsible for them. Such ships will also receive directions from the commander of the port where they lie at anchor.

203. If in special cases it is necessary to use a cargo ship for transporting wounded, sufficient personnel and supplies will be temporarily provided for it. Serious cases, epidemic diseases, and insane will not be transported.

204. The chartering or requisition of ships for hospitals will be arranged by the transportation commander when the Inspector-General of Field Sanitation applies for them.

205. Hospital ships will be under the control of the headquarters of the port which is appointed by the transportation commander, but directions in reference to their medical service will be received from the Inspector-General of Field Sanitation.

206. At the request of the Inspector-General of Field Sanitation the commander of transportation will order the headquarters of a port to equip a hospital ship with special articles, but the order of the transportation commander is not needed for a hospital ship to obtain ordinary supplies.

207. When it is necessary to transport wounded by cargo ships, the Inspector-General of Field Sanitation must consult with the commander of transportation in reference to the matter.

208. A hospital ship shall be painted white, with a green streak of about 1 meter and a half. At the tops of the masts the national flag and the Red Cross flag will be hoisted. Boats which the steamer itself carries, and also boats used to embark or disembark sick and wounded, must be painted in the same way.

209. Hospital ships will be provided with rooms as follows: (1) Office; (2) wards for sick and wounded; (3) ward for epidemic diseases; (4) ward for insane; (5) operation room; (6) mortuary; (7) dispensary; (8) room for disinfection; (9) supply storeroom. The wards for sick and wounded must be divided into two sections—one for

serious and the other for slight cases—and the ward for epidemic diseases must be located in a detached place.

210. Beds for sick and wounded will be prepared on the middle deck. When lying lengthwise of the ship they will suffer less from the motion, but are more easily cared for if placed crosswise. When it is necessary to make beds on the upper deck, slightly wounded will be placed there and the awning will be stretched.

211. The number of medical personnel to be detailed on a hospital ship and the quantity of its supplies will be determined by the Inspector-General of Field Sanitation. Members of a Red Cross company may be used for the medical personnel, but the chief must be a military surgeon. This same article applies in the case of cargo ships.

212. The chief surgeon of a hospital ship and the senior of the medical personnel in a cargo ship must oversee the embarking and disembarking of the wounded, and must keep order and discipline on the ship. In case of violation of discipline he will investigate carefully, and through the commander of the port will inform the proper commander. For the services of the medical personnel, paragraphs 183 to 186 will apply.

213. In some cases regular cargo ships are provided with medical chests and the emergency box in care of the purser. These can be used on application of a surgeon, apothecary officer, or a civilian doctor.

214. At the ports of embarkation and disembarkation a rest station for the wounded will be established with the necessary supplies. If necessary, food and lodging will be provided.

215. This rest station is under the control of line of communication authority, and its personnel will come from the lines of communication or from other troops.

216. Notice will be given previous to the embarkation of sick and wounded by the hospital or other dispatching authority to the chief surgeon of the hospital ship and to the port commander. The trip of sick and wounded to a port of embarkation shall only begin after information has been received that the hospital ship is ready.

217. Those sick and wounded who can not board by the gangway will be embarked by a sling or other proper means.

218. Hospital ships must have coffins for the dead; the number provided will be in accordance with the size of the steamer and length of the voyage. They will be made of thick boards, and when used, turpentine will be applied so as to seal them closely. Lime will be placed in the coffin with the body, and in case death has been due to an epidemic disease, a cloth soaked in bichloride will also be wrapped around it.

219. Hospital ships and cargo ships for wounded must be carefully cleaned after each voyage. If necessary, disinfection will be practiced. In hospital ships the medical personnel will do this cleaning under the direction of the chief surgeon. Cargo ships will be cleaned by the headquarters of the port. Boats and articles used in embarking and disembarking cases of epidemic disease must always be disinfected after use.

220. The chief surgeon of a hospital ship and the chief of the medical personnel attached to a cargo ship must report at the end of each trip to the Inspector-General of Field Sanitation through the port commander. This report will refer to the trips, the wounded, and the consumption of supplies. A sick report will also be sent. (See Appendix V.)

221. When a hospital ship is released from such service its chief surgeon will send the diary, case sheets, and other necessary reports to the Inspector-General of Field Sanitation through the port commander.

222. In the transportation of wounded by river or stream these same rules will apply. But if boats or ships belonging to the lines of communication are used the commander of the lines of communication will make the plans for such transportation. If necessary, he will consult with port commanders and the transportation will be carried out by lines of communication post commanders, the chief surgeon of the lines of communication directing the medical service.

LAND TRANSPORTATION OF SICK AND WOUNDED.

223. Transportation of sick and wounded by land pertains to the duties of the department for transporting patients, but

when the lines of communication are long and the transporting service in the advance is much occupied, the service in the rear must be undertaken by line of communication posts.

224. As vehicles for the wounded, litters, carts, animals, kagos, or other improvised materials bought or made in the district will be used depending on the character and nature of the wounds or sickness, the weather, and the roads.

225. These vehicles will be prepared by the department for transporting patients or by the posts on the lines of communication, but if necessary, instructions of the commander of the lines of communication will be received.

226. The number of medical personnel for this service and the guard to accompany wounded during transportation will be determined by the commander of the lines of communication, or the commander of the line of communication posts in accordance with special conditions.

MEDICAL SERVICE OF FORTRESSES AND GARRISONS.

227. The medical services of fortresses differ, depending upon whether the garrison is a large or a small one. Paragraphs 228 and 253 apply to large fortresses and the Tsushima garrison and other small fortresses will make their own regulations, based upon these, but modified in accordance with their needs.

228. The chief surgeon of a fortress, under the command of the fortress commander, superintends the medical service of the fortress and oversees the fortress hospital.

229. From the day of the proclamation of martial law the chief surgeon will also superintend the medical service of the district under direction of the fortress commander.

230. The chief surgeon will receive directions from the division chief surgeon while communication is uninterrupted. But when there is not time for this, he may take proper measures after consultation with the chief of the fortress staff.

231. The chief surgeon will be informed in respect to the proposed operations of the fortress in order that he may properly execute his duties.

232. The chief surgeon can organize under the directions of the fortress commander a fortress sanitary company consisting of officers, medical officers, apothecary officers, non-commissioned officers and privates. The material for transporting sick and wounded will be provided by this company.

233. The chief surgeon is authorized to command the medical personnel and the Red Cross personnel and to employ them in the fortress hospital and in other medical department work. But the Red Cross personnel must not be used for service on the firing line.

234. The chief surgeon must always carefully execute proper measures for the hygiene of the command and of the public. For carrying out this purpose he is the general superintendent of the fortress sanitary committee. This committee consists of the surgeons, civilian doctors, the apothecaries, and the civil officials of the town.

235. The chief surgeon must plan to enlarge the fortress hospital or to establish a branch of it if necessary. The fortress hospital must have accommodation for sick and wounded in time of war sufficient for one-eighth of the strength of the command of the fortress.

236. The chief surgeon may recommend to the fortress commander in reference to the use of the personnel of the Japanese Red Cross and the hiring of necessary civilian doctors, apothecaries, and nurses.

237. The chief surgeon will have consultations with the chief of staff of the fortress and will obtain sufficient supplies so that no shortage may occur in caring for sick and wounded.

238. The chief surgeon will apply to the fortress commander for the men (train soldiers), vehicles, etc., necessary for transporting the wounded.

239. The chief surgeon must attempt to provide rapid transportation for wounded to the fortress hospital. For this he will use the fortress sanitary company and the carts, boats, or other vehicles belonging to it.

240. The chief surgeon must always keep informed in reference to railway and water transportation and transfer by them sick and wounded who will apparently require a considerable time for recovery, bringing them out of the fortress before it is besieged.

241. After every battle the chief surgeon will report in reference to the fortress sanitary company and the hospital to the fortress commander and to the division chief surgeon.

242. The chief surgeon will examine the reports and letters from the various medical organizations under him and will forward them as may be proper to the Inspector-General of Field Sanitation, to the Chief of the Medical Bureau of the War Department through the division chief surgeon, or directly to the fortress commander.

243. The chief surgeon will take proper measures to provide medical attendance to fortress headquarters.

244. After the war the chief surgeon must make a minute report to the Chief of the Medical Bureau of the War Department.

FORTRESS SANITARY COMPANY.

245. The fortress sanitary company is charged with the duty of opening a dressing station behind the firing line, of caring for the wounded, and of transferring them to the fortress hospital as quickly as possible. The personnel of the sanitary company of the fortress will also assist the fortress hospital and the medical service of other units as far as their proper duties will permit.

246. The movements of the fortress sanitary company will be by order of the fortress commander, and they will also receive directions from the fortress chief surgeon regarding the medical service.

247. The regulations for division sanitary companies will apply to the fortress company.

FORTRESS HOSPITAL.

248. The director of the fortress hospital superintends the administration of the hospital and is held responsible for the proper performance of duty by his subordinates.

249. Men and matériel necessary for transferring wounded from the hospital shall be obtained by application to the fortress medical department.

250. The education and training of the fortress medical personnel will be given at the hospital.

232. The chief surgeon can organize under the directions of the fortress commander a fortress sanitary company consisting of officers, medical officers, apothecary officers, non-commissioned officers and privates. The material for transporting sick and wounded will be provided by this company.

233. The chief surgeon is authorized to command the medical personnel and the Red Cross personnel and to employ them in the fortress hospital and in other medical department work. But the Red Cross personnel must not be used for service on the firing line.

234. The chief surgeon must always carefully execute proper measures for the hygiene of the command and of the public. For carrying out this purpose he is the general superintendent of the fortress sanitary committee. This committee consists of the surgeons, civilian doctors, the apothecaries, and the civil officials of the town.

235. The chief surgeon must plan to enlarge the fortress hospital or to establish a branch of it if necessary. The fortress hospital must have accommodation for sick and wounded in time of war sufficient for one-eighth of the strength of the command of the fortress.

236. The chief surgeon may recommend to the fortress commander in reference to the use of the personnel of the Japanese Red Cross and the hiring of necessary civilian doctors, apothecaries, and nurses.

237. The chief surgeon will have consultations with the chief of staff of the fortress and will obtain sufficient supplies so that no shortage may occur in caring for sick and wounded.

238. The chief surgeon will apply to the fortress commander for the men (train soldiers), vehicles, etc., necessary for transporting the wounded.

239. The chief surgeon must attempt to provide rapid transportation for wounded to the fortress hospital. For this he will use the fortress sanitary company and the carts, boats, or other vehicles belonging to it.

240. The chief surgeon must always keep informed in reference to railway and water transportation and transfer by them sick and wounded who will apparently require a considerable time for recovery, bringing them out of the fortress before it is besieged.

241. After every battle the chief surgeon will report in reference to the fortress sanitary company and the hospital to the fortress commander and to the division chief surgeon.

242. The chief surgeon will examine the reports and letters from the various medical organizations under him and will forward them as may be proper to the Inspector-General of Field Sanitation, to the Chief of the Medical Bureau of the War Department through the division chief surgeon, or directly to the fortress commander.

243. The chief surgeon will take proper measures to provide medical attendance to fortress headquarters.

244. After the war the chief surgeon must make a minute report to the Chief of the Medical Bureau of the War Department.

FORTRESS SANITARY COMPANY.

245. The fortress sanitary company is charged with the duty of opening a dressing station behind the firing line, of caring for the wounded, and of transferring them to the fortress hospital as quickly as possible. The personnel of the sanitary company of the fortress will also assist the fortress hospital and the medical service of other units as far as their proper duties will permit.

246. The movements of the fortress sanitary company will be by order of the fortress commander, and they will also receive directions from the fortress chief surgeon regarding the medical service.

247. The regulations for division sanitary companies will apply to the fortress company.

FORTRESS HOSPITAL.

248. The director of the fortress hospital superintends the administration of the hospital and is held responsible for the proper performance of duty by his subordinates.

249. Men and matériel necessary for transferring wounded from the hospital shall be obtained by application to the fortress medical department.

250. The education and training of the fortress medical personnel will be given at the hospital.

251. When sick and wounded in the fortress hospital have entirely recovered, or when they are discharged from the military service, the regulations for reserve hospitals will be applicable.

252. Detailed regulations for the internal administration of the fortress hospital will be specially compiled.

MEDICAL SERVICE OF FORTRESS AND GARRISON.

253. For the medical service of a fortress or garrison, paragraphs 14 to 32 will apply, and in addition the following regulations will be enforced: 1. The medical personnel attached to regiments or other troops will be employed in the fortress hospital or in those of nearby troops under the orders of the fortress chief surgeon. 2. A rest station will be established for several bodies of nearby troops and the wounded of other troops may be cared for here. 3. The wounded at the dressing station (temporary) will be transferred to the fortress hospital and the means of transportation will be prescribed by the local commander or the unit commander.

THE MEDICAL SERVICE OF THE DIVISION REPLACING THE ONE WHICH HAS GONE TO THE FRONT.

254. The division chief surgeon under the control of the division commander superintends the medical service and medical affairs in general. The service regulations for the division chief surgeon in time of peace will apply, except in those particulars which are now especially mentioned.

255. The division chief surgeon must occasionally visit the various troops in his division to inspect in regard to sanitation and the medical service.

256. If necessary, the division chief surgeon will enlarge the reserve hospital and may establish branches.

257. The division chief surgeon will provide the necessary personnel for sick and wounded in the reserve hospital, and when required will recommend to the division commander the employment of the Red Cross personnel and civilian employees.

258. The division chief surgeon will transact all affairs

in reference to the education and training of medical department soldiers, including noncommissioned officers.

259. The medical service of the reserve troops will be based upon the peace medical service regulations.

RESERVE HOSPITALS.

260. Reserve hospitals are employed to care for sick and wounded brought back from the front and for those of the various troops at home in its division, but sick and wounded of troops passing through the place where it is located or staying there may be cared for if necessary.

261. The director of the reserve hospital under control of the division commander is held responsible for the proper performance of duties by his subordinates. He will also receive the directions of the division chief surgeon.

262. After mobilization has been completed, the training and education of noncommissioned officers and men of the medical department will be carried on at the reserve hospital.

263. Sick and wounded able to leave the hospital on recovery will be transferred to the proper reserve troops; but if there are no such troops, application for directions will be made to division headquarters.

264. If no clothing is on hand for patients about to leave the hospital, report of this will be made to the troops to which they are to be transferred. If there are no proper troops to which to transfer them or such troops are far distant, proper measures will be taken under direction of division headquarters.

265. In case sick or wounded be discharged from the military service, peace regulations respecting this will be applicable.

266. Detailed regulations for the internal administration of reserve hospitals will be specially compiled.

GENERAL INFORMATION IN REGARD TO HOSPITALS.

267. Sick and wounded will first be received in the receiving and forwarding department, where they will be included in the list of hospital patients and will be examined, attention being given to the diagnosis tag, and divided into two

classes, serious and slight, and will then be distributed to the proper wards. Serious cases must be cared for first. A table to show the wards and their vacancies will be made for convenience.

268. When a hospital becomes overcrowded with patients, only serious cases will be retained, the slight being forwarded farther to the rear.

269. The arms and accouterments of patients will be registered in a book, and a tag will be attached to them to show the name, regiment, and rank of the soldier to whom they belong, and they will be carefully kept with the clothes which will be replaced with hospital clothing. The tag shall be of thick paper, a wooden board, or of cloth. Rifles will be carefully oiled before being stored, especially the bore and action. The money and valuables of seriously sick or wounded will be carefully examined in the presence of the patient and will be given to the intendance sergeant with a list, in order that they may be cared for.

270. The arms, knapsack, etc., of patients who do not appear likely to recover soon will be forwarded to the near-by line of communication post with a list, and receipt shall be obtained. If patients have ammunition, it should be at once forwarded to the near-by line of communication post.

271. When patients recover, so as to be able to leave the hospital, this will be noted on the hospital list and a certificate of permission to leave will be given them. When the articles which have been cared for are returned to them, they will receipt on the above-mentioned list. Proper measures will then be taken to have them join the troops to which they belong or to report to the near-by line of communication post.

272. When patients die on their way to a hospital, proper measures will be taken by the intendance sergeant in accordance with paragraph 301 and paragraphs 305 to 307. A certificate of death will be prepared in the receiving and forwarding department which, after receiving the signature and seal of the director of the hospital, will be quickly dispatched.

273. When wounded are admitted to a hospital, the diagnosis, as given on the diagnosis tag, will be entered in a

book, and a new tag will be attached to the bed. The diagnosis tag will be sent to the main department of the hospital. The ward surgeon will make a daily history of each case with a record of treatment.

274. At a field hospital the patient's clothing may not be changed, but when it is replaced by hospital clothing it will be made into a bundle, tagged, and transferred to the receiving and forwarding department.

275. As soon as patients are settled in bed the ward surgeon will visit them and note in the daily history a description of the case, also giving necessary prescriptions to be sent to the dispensary. The kitchen will be informed as to the patients' requirements in reference to food. When a diagnosis is settled upon or changed, the receiving and forwarding department will be notified.

276. When patients leave the hospital on recovery, or when they are removed from it, the surgeon in charge of them will make a list of their names. This will be signed by the hospital director and transferred to the receiving and forwarding department. The surgeon in charge of them will sign his name and enter the date at the end of their daily histories, and these and the prescription books will be transferred to the receiving and forwarding department through the main department. In case of removal the name of the hospital to which the patient is transferred will be mentioned.

277. When a patient dies the body will be at once removed to the mortuary and a report made to the receiving and forwarding department. A watch will also be stationed. The surgeon in charge of the patient will then make a certificate of death, which will be forwarded to the director of the hospital, who will sign it, after investigation, and send it to the receiving and forwarding department. Its duplicate will be kept in the main department. Article 276 will apply in reference to the daily history and prescription book. In the daily history the cause of death and the time must be noted.

278. The director of the hospital will make regulations in reference to the medical service of the hospital, for the promotion of good order and for the prevention of fires.

279. The food of patients will be the ordinary ration or soft boiled rice, eggs, and sai (which means all food in

addition to rice), but when required any kind of food may be supplied.

280. The chief nurse attached to the wards for patients will notify the kitchen in reference to the food required for them and at meal times will send a nurse for it. In those hospitals which are not provided with mess articles the mess boxes of the soldiers will be used.

281. When a hospital becomes crowded suddenly, paragraph 280 will not apply, but the receiving and forwarding department will notify the kitchen directly of the approximate number of meals which will be required, and an attempt will be made to supply warm food as quickly as possible to all, even to those who are going to other hospitals.

282. The intendance officer will supply proper rations for patients and will superintend the cooking.

CONVALESCENT CAMPS, RETURN HOME, AND SICK FURLOUGH.

283. Patients will be sent to a convalescent camp, home, or on sick furlough in case they need no more treatment at a reserve (fortress or Tsushima garrison) hospital. Convalescent camps will be established at proper places on the seashore or at hot springs. Those patients who do not seem likely to recover soon and who will be pensionable will be sent home. (These are called A class.) Those A class wounded who are not pensionable and who do not appear likely to recover soon and B and C class patients may also go home on their own applications.

284. Detailed instructions will be specially made for patients who take advantage of the former article. Certificates (Appendix 8) will be given those going home or on sick furlough.

285. Field hospitals, stationary hospitals, and line of communication hospitals must always be very careful to avoid overcrowding, and shall take proper measures to forward patients to reserve hospitals as soon as possible.

286. The director of a hospital shall examine into the physical strength and condition of patients, taking into consideration the distance and the hardships of a transfer, and shall select those who can best bear transportation.

287. Transportation of epidemic diseases will be performed in accordance with the epidemic prevention regulations, which are specially made, and disinfection shall be carefully carried out. Transportation shall be by hospital ships or trains.

288. Special care must be taken in transporting insane or those who present symptoms of insanity, so that danger to themselves or to those who accompany them may be avoided.

289. Patients of the enemy who apparently will not recover during the war or who are quite disabled for the service will be intrusted to the district administrative organization in the field of operation.

290. On the transfer of patients the number, and the character of the sickness or wounds will be previously reported to the place to which they are to be transferred. Special notification will be given in case epidemic diseases are to be sent. Slight cases are those who can walk or who can be transported in a cart in a sitting position. Serious cases are those who must be carried or those who must be transported in a cart in a lying down position. In water transportation the chief surgeon of the hospital ship will dispatch a telegram of notification from a proper point to his destination, and in other cases the same will be done by the senior surgeon of the medical personnel in charge.

291. In forwarding patients a man will be put in charge to accompany them, except in railway or motor transportation, when such duties will be performed by the medical personnel regularly attached. The man in charge will take the forwarding certificate, the daily histories, and the prescription books. He will also carry a list of their arms and accouterments, and, when there are serious cases, their money and valuables with the list; all will be delivered at the hospital to which they go and receipts obtained. B form of list will be made out for sick and wounded transferred. (See Appendix IX.) Special forms are also prescribed for the list of arms and accouterments and for the list of money and valuables.

292. On the journey, if the man in charge is obliged to deliver patients at a place other than that designated, the former article will be complied with. If a patient dies on

the way, the body, arms, accouterments, and private property will be delivered to the nearest post on the lines of communication, from which receipts will be obtained. The soldier in charge will record the circumstances on the forwarding list. He will also note it on the daily history, which he will bring back with the prescription book. On the daily history the date, hour, and place of death shall be stated. When the report of the death is made at the dispatching hospital, a certificate of death will be prepared there and promptly forwarded. The daily history and the prescription book of the man who has died will be put on record at the dispatching hospital.

293. Military passports for patients and for the man in charge of them will be obtained from the line of communication post and given to them before their departure.

294. When rail or water transportation is to be utilized, the dispatching hospital will notify the station or the port headquarters, as the case may be, and await information of the time when the train or ship will leave. Patients must reach a railway station one hour and a port two hours before the time of departure of the train or ship. The dispatching hospital is responsible for patients until they are loaded on a train or ship.

295. Serious cases will be embarked first, while slight cases will be disembarked from a train first, but last from a ship. Epidemic diseases will be the last in any case.

296. Rations for patients during a trip by rail will be supplied at the supply station designated by the railway line commander. When special kinds of food are needed, the dispatching hospital or office will notify the headquarters of the embarking station, which will inform the supply station previous to the embarkation.

297. Patients transported by rail or ship will be received by the receiving committee of the hospital or office to which they are sent. The receiving hospital or office will be responsible for transporting them from the point of disembarkation, and is required to dispatch necessary personnel and supplies to their place of landing and must be ready to receive them, it being understood that it has been notified.

298. The receiving committee of the receiving hospital or

office will examine the certificate of forwarding, daily histories, prescription books, and lists of property, and give receipts on B form of list of sick and wounded transferred, on list of arms and accouterments, and on list of money and valuables.

299. Killed at the firing line will be searched for by the various troops there, so that members of the medical department need not carry them away unless they are ordered to do so. It is desirable, however, when possible, to collect the dead at one point, or to put up a sign to indicate where they may be found.

300. If wounded die in the temporary dressing station, the body, the certificate of death, arms, accouterments, and private property will be transferred to the troops to which the man belonged. The troops will then properly dispose of the body.

301. The bodies of those who die while being transported to a dressing station or to a field hospital, and those who die after arrival at either place, will be transferred to the troops to which they belong, to the near-by line of communication post, or will be buried at the place of death under the directions of the division commander.

302. Bodies of those who die at any of the various hospitals on the lines of communication or at the department for transporting patients will be transferred to the near-by line of communication post.

303. Bodies of those who die during railway transportation will be transferred to the disembarking station headquarters, but if there be any station on the way at which a stop of as long as half an hour is made, and there is a line of communication post near by, the body will be transferred to that post.

304. Bodies of those who die during water transportation will be transferred to the line of communication post at the landing place or to that of any port at which a stop is made on the way, but burial over the side may be practiced under unavoidable circumstances.

305. Bodies of those who die at military hospitals at home will be transferred to the troops to which they belong or to

their reserve troops. If there be no troops to which such a transfer may be made or these troops are at too great a distance, the reserve hospital will take proper measures for disposing of the body, or it may be transferred to a proper applicant.

306. Bodies of those who die of epidemic diseases shall be burned, but in case they must be transferred the body shall be wet with a sufficient quantity of carbolic acid solution or bichloride, or it may be wrapped in cloths wet with such solutions.

307. The arms, accouterments, will, and private property of dead will be transferred, with a list to the troops to which the body is delivered, and receipts will be given for the corpse and the will, while on the other lists a certificate of receipt will be made. In addition, in cases falling under paragraphs 303 and 304, a certificate of death will be sent with the body.

308. When bodies are received by troops, they must be burned if possible, and a lock of the hair of the head, a portion of the larynx, the will, the property, money, and valuable articles transferred to the division headquarters of the man's permanent place of registry. Those whose permanent registry is in the Formosan Pescadores will be transferred to the Formosan administrative government.

309. When death occurs in a hospital, the certificate of death will be dispatched by the director to the division headquarters or to the Formosan government. In cases falling under article 303 or 304 the line of communication post commander, and in other cases the commander of the troops or of the near-by line of communication post, will take the same action. When the division headquarters receives the above-mentioned certificate, the officer in charge will transfer it through the mayor or through the registry office of the town to the relatives, who are held responsible for taking those measures required under the civil code, but the duplicates shall be filed at the sending hospital with the daily history and the prescription book. For those dying of a A class disease, two certificates of death will be made, one of which is for the pension bureau and the other for disposition as given above.

310. The report of death shall be made to the division

headquarters or to the Formosan government for their permanent registry from the officers mentioned in paragraph 309. When bodies of those who die at a dressing station are transferred to a line of communication post, the troops to which they belong shall be notified.

311. Wills of patients will be legally prepared in accordance with article 2, sixth chapter of the fifth section of the Japanese Civil Code.

MEDICAL SUPPLIES.

312. The surgeon carries a surgical case, the chief nurse (except those engaged as apothecaries) a chief nurse's pouch, and the nurse a nurse's pouch. The chief nurse and nurses also carry a receptacle for boiled water. Besides this they carry in their knapsacks three triangular bandages and ten Doctor Gooch's splints; one pouch will be given to each litter bearer party. Each noncommissioned officer and each private of troops will be issued a first-aid packet, which will be fastened on the inner side of the left skirt of his coat. In war these packets should only be used for dressing wounds.

313. When the cavalry or engineers in an engagement use all their medical supplies and will suffer from want of them, they may go to near-by troops which have medical chests to obtain others.

314. Among the supplies of reserve clothing for troops, blankets for wounded will be carried. These will be used for temporary hospitals at camping places and will be lent to a temporary dressing station or a dressing station when a request is made for them. At a dressing station it is not required that wounded be provided with blankets and the dress for the sick, but in case blankets have been obtained by application to near-by troops they must be returned when they are no longer required.

315. The senior surgeon of each unit and the chief surgeon of each of the various medical department organizations are in charge of the medical supplies under the direction of their commanders.

316. Applications for medical supplies will be as follows:
1. The various troops (except the sanitary company and the

field hospital) in the division shall apply to the division medical department in accordance with article 28 of war-time supply regulations; then the division medical department will order the sanitary company or the field hospital to supply them. But in certain cases the division medical department will apply directly to the line of communication medical department to obtain supplies from the sanitary reserve storehouse for the troops of the division. The sanitary company and the field hospital will apply, not through the train battalion, but directly to the division medical department, which will order the line of communication medical department to supply them. Then the line of communication medical department will order the sanitary reserve storehouse of the division, or in some cases the sanitary reserve storehouse of another division, to furnish the supplies.

2. The various troops (except the sanitary reserve storehouse) on the lines of communication shall apply in accordance with article 28, C form of the war-time supply regulations, to the line of communication medical department, which will order the line of communication hospital or the sanitary reserve storehouse to supply them.

3. The troops belonging to the general headquarters in the field and to the army headquarters shall apply to the Inspector-General of Field Sanitation or to the army medical department, when the Inspector General of Field Sanitation or the army medical department will order a division medical department or a line of communication department to supply them, but military offices a part of general headquarters located at home shall apply to the division medical department at the place where they are stationed. Then the division medical department will order the reserve hospital to supply them.

4. Fortress troops shall apply in accordance with article 28, D form of the war-time supply regulations, to the fortress medical department (if there be no medical department of the fortress, then application shall be made directly to the fortress commander); the fortress medical department will order the fortress hospital to supply them. When the fortress hospital requires medical supplies it will apply to the fortress medical department, which will apply to the division medical department to which the fortress belongs. In case communication

is interrupted, the chief surgeon of the fortress medical department will take proper measures under direction of the fortress commander. 5. The various troops of the second reserve and the various bodies of the national army shall apply, in accordance with article 28 of the war time supply regulations, to the medical department of the headquarters under which they are controlled. 6. The sanitary reserve storehouse shall apply to the line of communication medical department, which will order the second reserve storehouse to supply them. 7. The second reserve storehouse shall apply to the War Department, which will order the main sanitary supply storehouse or the division medical department, in place of the one gone to the front, nearest to the second reserve storehouse to supply it. When the chief of the line of communication medical department orders such and such a sanitary reserve storehouse to issue supplies, the facts shall be reported to the commander of the lines of communication.

317. In special emergency cases when medical supplies are needed very quickly, or when there is great difficulty of communication, some of the procedure of paragraph 316 may be omitted, when report should be made to the proper department.

318. Requisition and purchase of medical supplies will be done under command of the proper division by its chief surgeon and chief intendance officer, but in emergency cases the regimental surgeon and intendance officer may make necessary purchases under orders of the regimental commander. In this instance immediate report of the kinds and quantity of the supplies and the name of the place of requisition and purchase shall be made to the superior commander.

319. The surgeons and apothecaries of the various organizations must use great care to store medical supplies in good order and to allow chief nurses to have access to them and to care for them.

320. If medical instruments, etc., require repair or extensive cleaning, the various troops in the advance and the sanitary company may apply to a field hospital for this. If the repairs can not be made there, or some of the articles are no

field hospital) in the division shall apply to the division medical department in accordance with article 28 of war-time supply regulations; then the division medical department will order the sanitary company or the field hospital to supply them. But in certain cases the division medical department will apply directly to the line of communication medical department to obtain supplies from the sanitary reserve storehouse for the troops of the division. The sanitary company and the field hospital will apply, not through the train battalion, but directly to the division medical department, which will order the line of communication medical department to supply them. Then the line of communication medical department will order the sanitary reserve storehouse of the division, or in some cases the sanitary reserve storehouse of another division, to furnish the supplies.

2. The various troops (except the sanitary reserve storehouse) on the lines of communication shall apply in accordance with article 28, C form of the war-time supply regulations, to the line of communication medical department, which will order the line of communication hospital or the sanitary reserve storehouse to supply them.

3. The troops belonging to the general headquarters in the field and to the army headquarters shall apply to the Inspector-General of Field Sanitation or to the army medical department, when the Inspector General of Field Sanitation or the army medical department will order a division medical department or a line of communication department to supply them, but military offices a part of general headquarters located at home shall apply to the division medical department at the place where they are stationed. Then the division medical department will order the reserve hospital to supply them.

4. Fortress troops shall apply in accordance with article 28, D form of the war-time supply regulations, to the fortress medical department (if there be no medical department of the fortress, then application shall be made directly to the fortress commander); the fortress medical department will order the fortress hospital to supply them. When the fortress hospital requires medical supplies it will apply to the fortress medical department, which will apply to the division medical department to which the fortress belongs. In case communication

is interrupted, the chief surgeon of the fortress medical department will take proper measures under direction of the fortress commander. 5. The various troops of the second reserve and the various bodies of the national army shall apply, in accordance with article 28 of the war time supply regulations, to the medical department of the headquarters under which they are controlled. 6. The sanitary reserve storehouse shall apply to the line of communication medical department, which will order the second reserve storehouse to supply them. 7. The second reserve storehouse shall apply to the War Department, which will order the main sanitary supply storehouse or the division medical department, in place of the one gone to the front, nearest to the second reserve storehouse to supply it. When the chief of the line of communication medical department orders such and such a sanitary reserve storehouse to issue supplies, the facts shall be reported to the commander of the lines of communication.

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2. The various troops (except the sanitary reserve storehouse) on the lines of communication shall apply in accordance with article 28, C form of the war-time supply regulations, to the line of communication medical department, which will order the line of communication hospital or the sanitary reserve storehouse to supply them.

3. The troops belonging to the general headquarters in the field and to the army headquarters shall apply to the Inspector-General of Field Sanitation or to the army medical department, when the Inspector General of Field Sanitation or the army medical department will order a division medical department or a line of communication department to supply them, but military offices a part of general headquarters located at home shall apply to the division medical department at the place where they are stationed. Then the division medical department will order the reserve hospital to supply them.

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field hospital) in the division shall apply to the division medical department in accordance with article 28 of war-time supply regulations; then the division medical department will order the sanitary company or the field hospital to supply them. But in certain cases the division medical department will apply directly to the line of communication medical department to obtain supplies from the sanitary reserve storehouse for the troops of the division. The sanitary company and the field hospital will apply, not through the train battalion, but directly to the division medical department, which will order the line of communication medical department to supply them. Then the line of communication medical department will order the sanitary reserve storehouse of the division, or in some cases the sanitary reserve storehouse of another division, to furnish the supplies.

2. The various troops (except the sanitary reserve storehouse) on the lines of communication shall apply in accordance with article 28, C form of the war-time supply regulations, to the line of communication medical department, which will order the line of communication hospital or the sanitary reserve storehouse to supply them.

3. The troops belonging to the general headquarters in the field and to the army headquarters shall apply to the Inspector-General of Field Sanitation or to the army medical department, when the Inspector General of Field Sanitation or the army medical department will order a division medical department or a line of communication department to supply them, but military offices a part of general headquarters located at home shall apply to the division medical department at the place where they are stationed. Then the division medical department will order the reserve hospital to supply them.

4. Fortress troops shall apply in accordance with article 28, D form of the war-time supply regulations, to the fortress medical department (if there be no medical department of the fortress, then application shall be made directly to the fortress commander); the fortress medical department will order the fortress hospital to supply them. When the fortress hospital requires medical supplies it will apply to the fortress medical department, which will apply to the division medical department to which the fortress belongs. In case communication

is interrupted, the chief surgeon of the fortress medical department will take proper measures under direction of the fortress commander. 5. The various troops of the second reserve and the various bodies of the national army shall apply, in accordance with article 28 of the war time supply regulations, to the medical department of the headquarters under which they are controlled. 6. The sanitary reserve storehouse shall apply to the line of communication medical department, which will order the second reserve storehouse to supply them. 7. The second reserve storehouse shall apply to the War Department, which will order the main sanitary supply storehouse or the division medical department, in place of the one gone to the front, nearest to the second reserve storehouse to supply it. When the chief of the line of communication medical department orders such and such a sanitary reserve storehouse to issue supplies, the facts shall be reported to the commander of the lines of communication.

317. In special emergency cases when medical supplies are needed very quickly, or when there is great difficulty of communication, some of the procedure of paragraph 316 may be omitted, when report should be made to the proper department.

318. Requisition and purchase of medical supplies will be done under command of the proper division by its chief surgeon and chief intendance officer, but in emergency cases the regimental surgeon and intendance officer may make necessary purchases under orders of the regimental commander. In this instance immediate report of the kinds and quantity of the supplies and the name of the place of requisition and purchase shall be made to the superior commander.

319. The surgeons and apothecaries of the various organizations must use great care to store medical supplies in good order and to allow chief nurses to have access to them and to care for them.

320. If medical instruments, etc., require repair or extensive cleaning, the various troops in the advance and the sanitary company may apply to a field hospital for this. If the repairs can not be made there, or some of the articles are no

field hospital) in the division shall apply to the division medical department in accordance with article 28 of war-time supply regulations; then the division medical department will order the sanitary company or the field hospital to supply them. But in certain cases the division medical department will apply directly to the line of communication medical department to obtain supplies from the sanitary reserve storehouse for the troops of the division. The sanitary company and the field hospital will apply, not through the train battalion, but directly to the division medical department, which will order the line of communication medical department to supply them. Then the line of communication medical department will order the sanitary reserve storehouse of the division, or in some cases the sanitary reserve storehouse of another division, to furnish the supplies.

2. The various troops (except the sanitary reserve storehouse) on the lines of communication shall apply in accordance with article 28, C form of the war-time supply regulations, to the line of communication medical department, which will order the line of communication hospital or the sanitary reserve storehouse to supply them.

3. The troops belonging to the general headquarters in the field and to the army headquarters shall apply to the Inspector-General of Field Sanitation or to the army medical department, when the Inspector General of Field Sanitation or the army medical department will order a division medical department or a line of communication department to supply them, but military offices a part of general headquarters located at home shall apply to the division medical department at the place where they are stationed. Then the division medical department will order the reserve hospital to supply them.

4. Fortress troops shall apply in accordance with article 28, D form of the war-time supply regulations, to the fortress medical department (if there be no medical department of the fortress, then application shall be made directly to the fortress commander); the fortress medical department will order the fortress hospital to supply them. When the fortress hospital requires medical supplies it will apply to the fortress medical department, which will apply to the division medical department to which the fortress belongs. In case communication

325. Reserve (fortress or Tsushima garrison) hospitals must pay traveling expenses, when necessary, to those who leave the hospital.

326. In addition to the above the various forms of accountability will be practiced in accordance with specially issued rules.

PERSONNEL OF THE JAPANESE RED CROSS ASSOCIATION.

327. The Red Cross personnel will be employed by order of the War Minister. The necessary number will be selected by the Inspector-General of Field Sanitation and report will be made to the commander-in-chief of the lines of communication or the Chief of the Medical Bureau of the War Department will select the number and report directly to the War Minister.

328. The personnel dispatched as far as the performance of their duties is concerned, will be employed under the direction of the Inspector-General of Field Sanitation and the commander and the chief surgeon of units to which they are assigned, but they are also under the command of the commander in chief of the lines of communication, division, fortress, or Tsushima garrison headquarters, the commander of the lines of communication, or the director of communications and transportation, as the case may be.

329. The badge of neutrality will be worn only by Red Cross personnel employed in the service.

330. This personnel shall be under military discipline and command.

331. The pay, traveling expenses, clothing, beds, etc., of this Red Cross personnel will be provided at the expense of the Red Cross corporation, but in some cases the Government will pay for their food, lodging, and transportation.

332. In addition to the above, the regulations of the Japanese Red Cross Society and those for the relief of sick and wounded shall be carefully observed.

PRESENTS FROM THE PEOPLE.

333. At military hospitals presents from the people for sick and wounded may be accepted unless they will be injurious to the health of patients or interfere with the dis-

longer of use, application may be made to the sanitary reserve storehouse to repair them or to exchange new ones for them, or proper measures may be taken for purchases in the town or district.

321. In addition to article 316, clothing for patients shall be supplied as follows: 1. The reserve (fortress Tsushima or garrison) hospitals shall apply to the intendance department, which will apply to the second reserve storehouse or to the War Department. 2. The second reserve storehouse shall apply to the War Department or to the intendance department of the division at home, which will order the clothing storehouse to furnish the supplies.

322. In addition to the above, men and horses will be furnished in accordance with the war-time supply regulations.

ACCOUNTING DEPARTMENT.

323. The chief of the sanitary company, the chief of the Sanitary Reserve Personnel, the superintendent of the sanitary reserve storehouse, the officer in charge of the department for transporting patients, the chief surgeon of a hospital train, the chief surgeon of a hospital ship, and the directors of the various hospitals will make application to the proper intendance department together with the receipts for money for the total expenses of about one month, and will take proper measures to account for the money obtained. The cash must be kept in chests, but some may be intrusted to the intendance officer in charge so that small payments may be conveniently made. At the end of each month the sum intrusted to the intendance officer will be accounted for.

324. Wounded in hospital will be paid on the regular pay days, but those who leave the hospital can obtain their pay on the day of departure irrespective of the regular pay day. Pay of the dead will pertain to their effects. When circumstances do not permit payment of those leaving the hospital, reports shall be made to the troops concerned. When patients entering the hospital have not been paid before admission, they will be paid if they have a certificate that payment has not been made to them. All patients in each ward will sign one receipt for their pay.

338. The records, the kinds of reports, and the procedures in reference to them, also the necessity for the various troops to make them, are described in the fifteenth appendix and will be made in accordance therewith.

NOTE.—The Japanese do not, as we do, distinguish between officers and men of the medical department by speaking of the former as the medical and the latter as the hospital personnel. Therefore, in this translation, the term “medical personnel” has been used for both.

SCHEME OF AID STATIONS AND HOSPITALS DURING ACTIVE OPERATIONS.

PLATE 1.

a. Line.

b. Caribotaljo (temporary dressing station).

The battalion medical personnel is on duty in battle, both on the line with the troops and at the temporary dressing station.

c. Hoteijo (dressing station). The personnel for this comes from the sanitary company.

d. Yassenbyoin (field hospital).

e. Telitzubyoin (stationary hospital), personnel, Sanitary Reserve Personnel.

f. Kanjiashikuhakujo (resting place for one night), personnel from transport department for patients.

g. Kanjialiojo (hospital where patients may be cared for during several days) personnel, either from transport department for patients, Sanitary Reserve Personnel, or line of communication hospital personnel.

h. Heitanbyoin (line of communication hospital) personnel from line of communication.

i. Kanjiashugojo (receiving hospital) personnel, transport department for patients.

f'. Kanjiashikuhakujo, personnel from Red Cross.

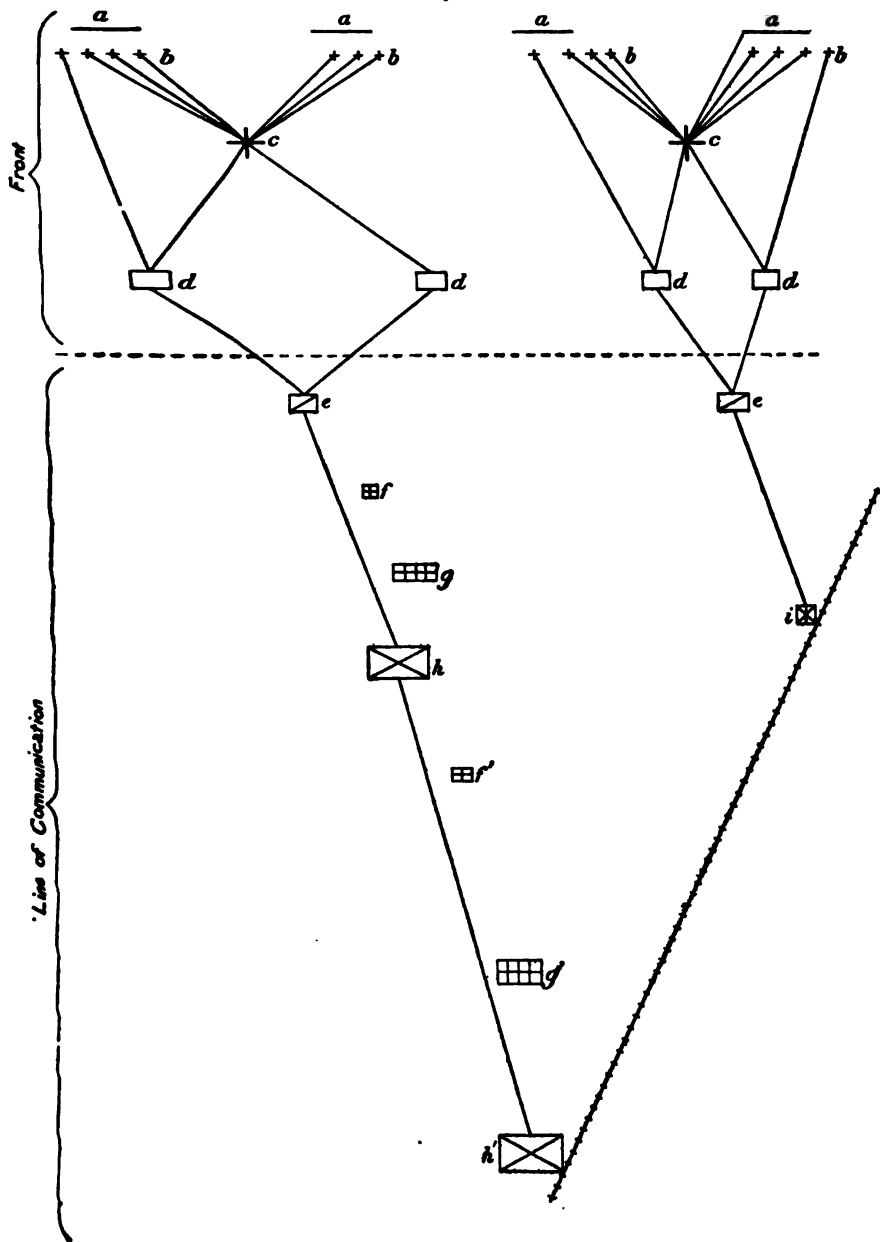
g'. Kanjialiojo, personnel from Red Cross.

h'. Heitanbyoin (line of communication hospital).

When the distance between the Telitzubyoin and Heitanbyoin is great, Kanjiashikuhakujo (resting places), or Kanjialiojo (hospitals in which patients may be cared for several days) may be established, as they may also between Heitanbyoin. Kanjiashugojo are receiving hospitals established by the transport department for patients on the railway line.

Scheme of Aid Stations and Hospitals during Active Operations

Plate I.



**SCHEME OF HOSPITALS DURING PERIOD BETWEEN
BATTLES.**

PLATE 2.

a. Regiments, which have regimental or battalion dispensaries manned by the regimental or battalion medical personnel.

b. Shelbyoin (immobilized field hospitals).

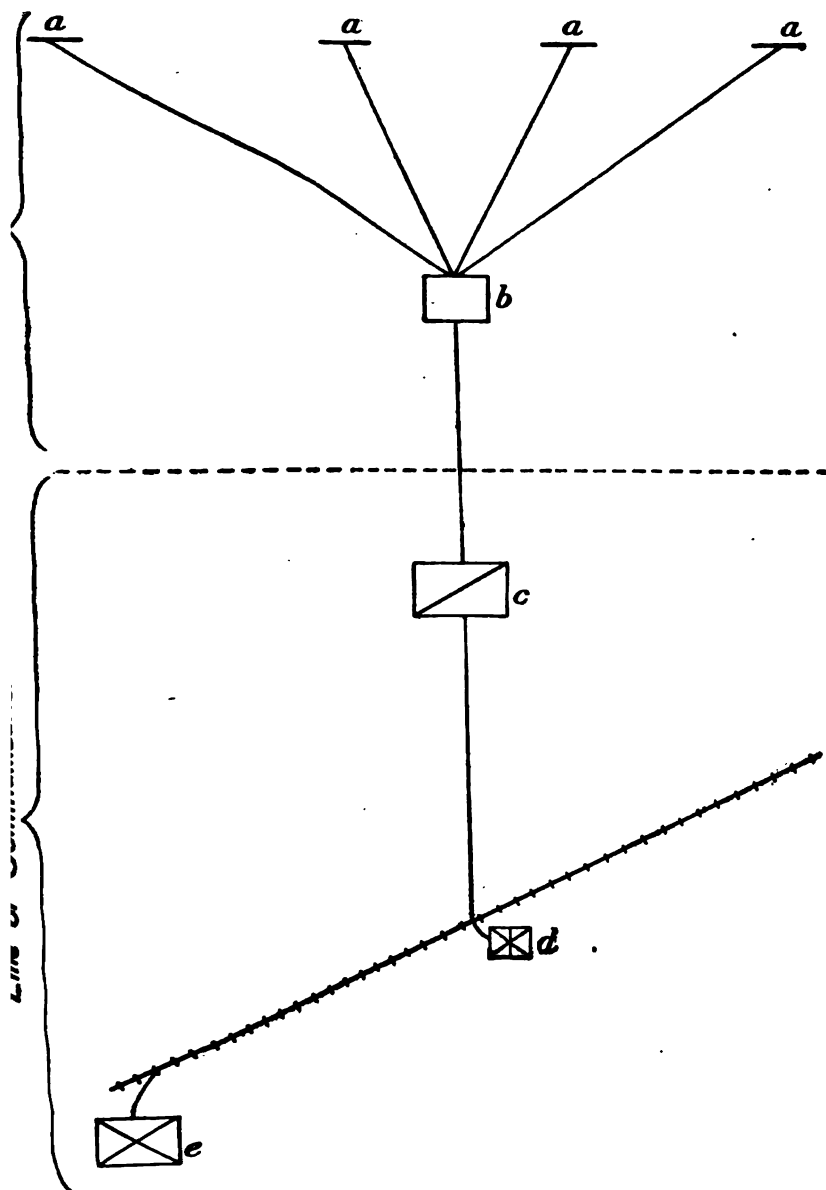
c. Kanjlabyoyojo (whole or part of stationary hospitals) Sanitary Reserve Personnel.

d. Kanjlashugojo, receiving hospitals, personnel, transport department for patients.

e. Heltanbyoin, line of communication hospital.

When the distances between the hospitals here shown on the lines of communication are great, resting places for patients may be established on the way, as illustrated in the scheme for active operations. Patients are also sometimes sent directly from shelbyoin to heltanbyoin.

Scheme of Hospitals during Period between *Battles* *Plate 2*



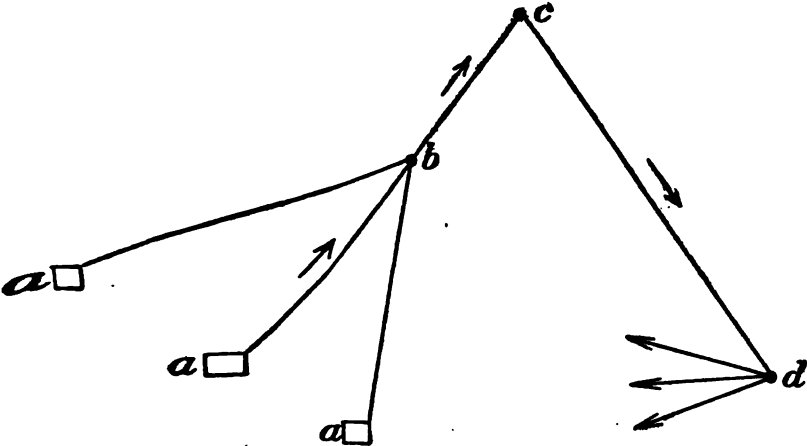
**SCHEME FOR TRANSPORT DEPARTMENT FOR PATIENTS
(APPLICATION FOR).**

PLATE 3.

- a. Field hospitals.**
- b. Chief surgeon of division.**
- c. Army chief surgeon.**
- d. Chief surgeon lines of communication.**

The small arrows indicate the channels of communication. The transport department for patients is directly under the chief surgeon of the lines of communication, who sends it to the field hospitals, as indicated by the large arrows.

Scheme for Transport Department for Patien
(Application for) ***Plate 3***



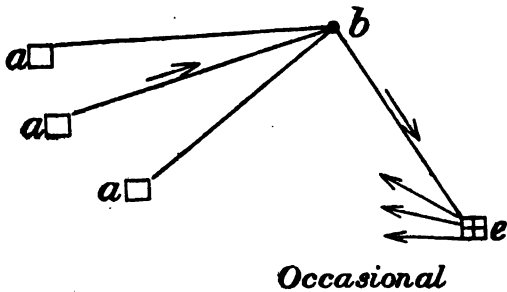
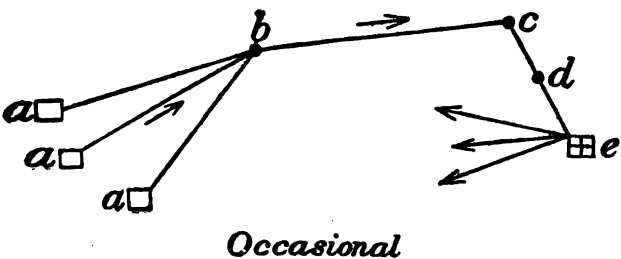
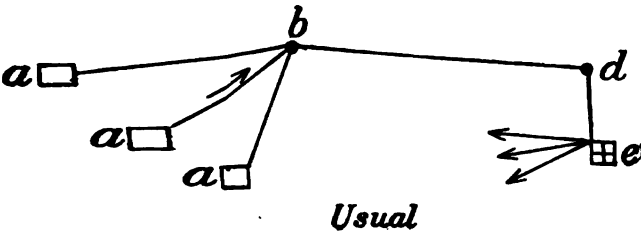
SCHEME FOR FURNISHING MEDICAL SUPPLIES IN BATTLE.

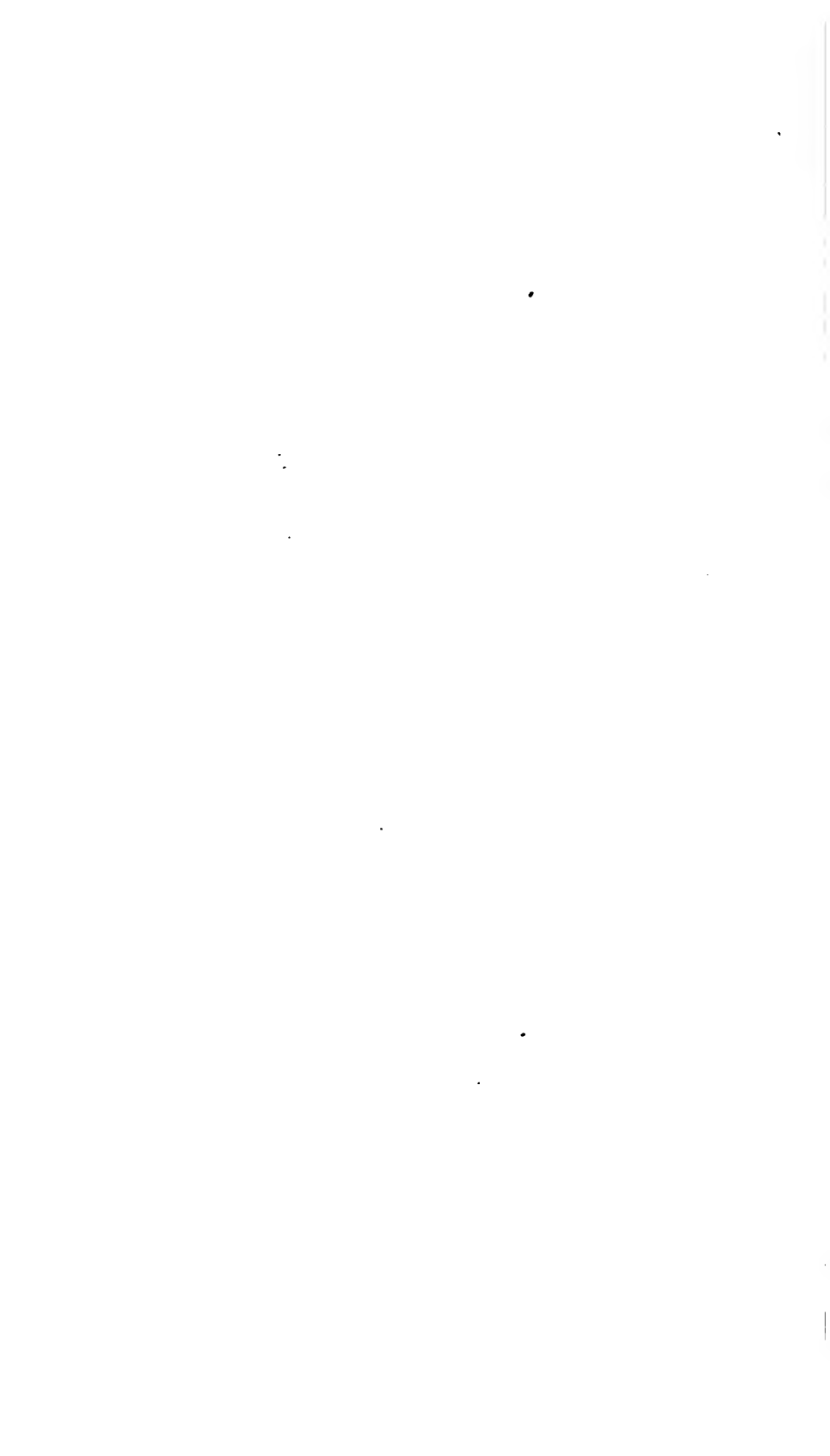
PLATE 4.

- a. Field hospitals.**
- b. Division chief surgeon.**
- c. Army chief surgeon.**
- d. Line of communication chief surgeon.**
- e. Advanced medical-supply depot.**

The small arrows indicate the direction which requests for medical supplies take, and the large ones the route of the supplies themselves.

*Scheme for furnishing Medical Supplies
in Battle* *Plate 4*





SERVICE REGULATIONS OF THE MEDICAL DEPARTMENT OF A
DIVISION.

(War Act No. 145, October 7, 1896.)

1. The chief surgeon of a division shall superintend, under the division commander, the medical affairs of the division and of the military school, if any, and shall oversee the service of the medical personnel.

2. The division surgeon will, although under the control of the division commander, receive the directions of the Chief of the Medical Bureau of the War Department with regard to the medical service, the training of the medical personnel and the taking of medical noncommissioned officers and privates.

3. The division surgeon shall prepare medical personnel and medical supplies in accordance with the plans for mobilization.

4. The division surgeon shall make inspections by order of the division commander once yearly of regiments (schools, if any), and shall then make reports on subjects of medical and sanitary interest to the division commander and to the Chief of the Medical Bureau of the War Department.

5. The division surgeon is authorized to direct members of the medical personnel of the division to report to him when he deems it necessary to consult them in regard to matters affecting the medical department.

6. In case more medical personnel is needed in regiments, schools, or other organizations on account of the large amount of medical work or on account of the absence of some of the regular medical personnel, the division surgeon is authorized to order medical personnel from other regiments to fill places temporarily. In case this occurs in Tokyo the chief surgeon of the Guards Division and the chief surgeon of the First Division will consult in regard to it.

7. The division surgeon may correspond directly with regiments, other military organizations, or schools in regard to business which he may have with them.

8. In the absence of the division surgeon the director of the military hospital, located in the same city as division headquarters, will fill his place temporarily.

9. Surgeons of the division shall assist the division surgeon as ordered by him.

10. In addition to that which has been hitherto specified, the division surgeon shall transact business included under the following heads:

1. Sanitation in regard to buildings, clothing, food, water, etc.
2. Physical examinations, discharge for disability, including pension certificates.
3. Medical personnel and supplies in time of peace and in time of war.
4. Medical statistics and sanitary reports.

INSPECTION OF CHIEF SURGEONS OF DIVISIONS.

(Injunction of the Chief of the Medical Bureau of the War Department, February, 1898.)

The chief surgeon of each division is required to make inspections in order that improvements may be effected in matters which pertain to the medical department. Reports of such inspections must therefore note existing conditions and state opinions as to what is necessary in order to correct or improve them. Attention should be paid to the following points:

(a) IN RESPECT TO SERVICE.

1. On instruction and competence of medical personnel, on diligence in performance of duties and any other points which affect the service of the medical department.

(b) IN RESPECT TO SANITATION.

2. On the health of officers, soldiers, students, employees, workmen, etc.
3. On barracks, quarters, and infirmary.
4. On guard rooms and military prisons.
5. On schools and military arsenals.
6. On clothing and food; on canteen.
7. On water.
8. On prevention of epidemic diseases.
9. On sanitary condition of military hospitals.
10. On places for disinfection.

(c) IN RESPECT TO THE CARE AND TREATMENT OF PATIENTS.

11. On disposition, beds, and food of patients.
12. On nursing and treatment.
13. On instruments and other supplies.

REGULATIONS GOVERNING SERVICE OF SURGEONS ATTACHED TO REGIMENTS.

(War Act No. 80, July 17, 1894.)

[Extract from general regulations of regimental service.]

CHAPTER VII.—*The regiment.*

ART. 8. The surgeon-major, under control of the commander of a regiment, will transact the sanitary affairs of the regiment and superintend and order the surgeons of battalions.

ART. 9. The surgeon-captain, under control of the commander of a regiment, will transact the sanitary affairs of the regiment and order surgeon-lieutenant (second lieutenant) and other inferiors in regard to the service.

ART. 10. The surgeon-lieutenant (second lieutenant), under control of the commander of a regiment, will assist the surgeon-captain in the service.

CHAPTER VIII.—*The battalion.*

ART. 11. The surgeons are under the control of the commander of the battalion, and the service will be conducted in accordance with Chapter VII, article 9 and article 10.

CHAPTER XI.—*Details of medical service.*

ART. 1. A medical service office shall be established in each barracks, and the examination of patients, general physical examination, vaccination, and other medical department affairs will be attended therein. The senior surgeon will be in charge of the office. It will be provided with a dispensary for the preparation of medicines.

ART. 2. Patients reporting, after examination by the surgeon will be divided into four classes: (a) Duty; (b) half rest; (c) entire rest; (d) admission to hospital. (a) Ordered to take service of the day; (b) allowed rest in the barracks; and (c) allowed to lie on beds in convalescent room.

The name and rank of the patient and his diagnosis will be registered in the record of patients.

ART. 3. In case there is a patient to be taken to hospital, notification shall be sent to the hospital, and it will be so arranged that he is carried there next morning between breakfast and 10 o'clock a. m.

ART. 4. For the procuring, repair, and exchange of instruments and drugs, application will be made to the military hospital.

ART. 5. A general physical examination will be made once a month by a surgeon-lieutenant (second lieutenant). The report of this will be forwarded by the senior surgeon to the commanders of the battalion and of the regiment. When new conscripts are received, they will be examined to find if they are physically qualified for service.

ART. 6. The office will be provided with the following records: (1) Daily record; (2) record of treatment; (3) record of the patients admitted to hospital; (4) record of physical examination; (5) record of orders; (6) record of reports; (7) record of prescriptions; (8) chit book. (1), (6), and (7) shall be preserved for ten years; (2), (3), (4), (5), and (8) for three years.

ART. 7. The dispensary is in charge of a surgeon-lieutenant (second lieutenant). The chief nurse may prepare medicines except those of a poisonous or dangerous nature. Poisonous and dangerous drugs must be locked in a closet; the key, after office hours, will be entrusted to the officer of the week.

ART. 8. A convalescent room will be provided for slightly ill patients who are likely to recover within 24 hours. It will be established in each company with accommodation in the proportion of 3 per cent of the number of soldiers. The patients in a convalescent room will be under care of a surgeon-lieutenant (second-lieutenant) and depending upon circumstances will be attended by a nurse of a company or by a private.

CHAPTER XXVI.—*A canteen.*

ART. 2. The class of articles to be sold at the canteen will be announced by the commander of a regiment. Drinks, cakes, and other things to eat will be examined by the surgeon.

REGULATIONS FOR THE CLEARANCE OF AND BURIALS ON THE
BATTLEFIELD.

(War Act No. 100, May 30, 1904.)

ART. 1. After each battle a clearance company will be organized to search for wounded, sick, and killed.

ART. 2. Sick and wounded will be cared for in accordance with medical service regulations in time of war. No matter whether the killed be our own soldiers or those of the enemy the corpses shall be carefully attended to in accordance with rank.

ART. 3. The names, rank, and companies, etc., of killed will be ascertained from pocket ledgers.

ART. 4. Habitually the corpses of our soldiers will be burned, while those of the enemy will be buried, but even the bodies of the enemy will be burned in case of epidemics.

ART. 5. Burial should not be performed unless death has certainly taken place.

ART. 6. The clearance company will collect bodies at one place and will cover them with mats. The enemy and our soldiers will be collected separately.

ART. 7. When the measures detailed in the foregoing article are completed, burial or burning in accordance with article 4 will take place as soon as possible.

ART. 8. In burial and burning the following will be observed:

(1) The places selected must be quite distant from roads, towns, villages, and stations of troops.

(2) The places selected must be far distant from water sources, streams, and wells.

ART. 9. The corpses of noncommissioned officers and soldiers will be separately burned, and bones not destroyed by the process will be sent home. The bones may, in certain cases, be buried temporarily and the hair only sent back. When circumstances require it, the hair of noncommissioned officers and privates will be sent home, and their corpses may be burned together.

ART. 10. When the hair and bones are delivered in Japan they will be buried in a military cemetery. If the families ask for them they may be surrendered. Bones which have

been temporarily buried at the front will be afterwards removed to the military cemetery at home.

ART. 11. In case of temporary burial of bones in accordance with article 9, the following shall be observed: (1) Bones of officers and those of lower rank will be buried separately. (2) Bones of noncommissioned officers and privates will also be buried separately. If this can not be done, they may be buried together. (3) Even in case of burial together, the tombs of officers and those of noncommissioned officers and privates shall be marked to distinguish them.

ART. 12. In the burial of corpses of the enemy the following shall be observed: (1) Bodies of officers will be buried separately. (2) Bodies of noncommissioned officers and privates will be buried separately, or less than 50 may be buried together. (3) Graves will be dug so that corpses will be placed 1 meter below the surface of the ground. (4) At the bottom of graves will be placed straw, on which corpses will be piled. Lime and ashes will be used to cover them. (5) Dirt excavated will be placed over the burial place so as to make a mound of earth.

ART. 13. In case burial is resorted to for our soldiers, the hair will be first cut off, and they will be buried in accordance with the foregoing article.

ART. 14. In case the enemies' corpses are burned, their bones will be buried in accordance with article 11.

ART. 15. The tombs of the enemy and of our soldiers will be properly marked to distinguish them.

ART. 16. At burials a proper ceremony will be celebrated in accordance with the rank of the dead, and the priest of the troops will be in attendance.

ART. 17. If corpses of the inhabitants of the locality are found on the battlefield, they will be buried as are enemies' corpses. When their families or relatives come for them, they will be permitted to take them.

ART. 18. The property of our soldiers killed will be packed together with their bones or their hair, and names, rank, company, and division will be noted on the boxes. The headquarters of the troop present will forward them to the headquarters of their division.

ART. 19. A list of bodies of the enemy will be made, stating their names, ages, nationalities, rank, companies, and places where the corpses were found, and place and date of burial. These will be reported, with their properties, by the headquarters or troops present to the information bureau for prisoners of war.

ART. 20. The property of the local inhabitants killed will be transferred to the local administrative organization so that it may be returned to their families or relatives.

ART. 21. Arms, rations, horses, and other property, whose owners are unknown, shall be properly treated by the headquarters or troop present, and will be made spoils of war.

ART. 22. The report of burials and the list of property described in the four previous articles will be forwarded to the next higher headquarters.

ART. 23. Dead horses will be buried or burned. In case of burying, (3) and (4) of article 12 will apply.

ART. 24. These regulations will also apply in the case of dead not on the battlefield.

SANITARY ADMINISTRATION IN ENCAMPMENT AND MARCH.

(War Act No. 3, July 20, 1894.)

(Though the regimental service regulations of 1888 were annulled, the fifth chapter of those regulations, which follows, is still in operation.)

CHAPTER 5.

12. In an encampment or march over one night or for a longer period a surgeon will be attached to each battalion. In a march during one daytime only a chief nurse and nurses will be required. In an encampment march of an infantry regiment one of the surgeons shall be a surgeon-major or captain. With an artillery regiment there will be one or two surgeons.

13. Encampment with march generally requires different provisions and service from the ordinary daily duty. The surgeon in charge must therefore be careful in regard to food, water, quarters, ground of encampment, etc., and if he

has any opinions to offer on these he must make proper recommendations to the commander.

14. Patients in march will receive attendance from the surgeon, who will give them certificates in accordance with the following classification:

1. *A* class patients: Unable to walk or unable to ride or walk in the case of mounted soldiers.

2. *B* class patients: Unable to carry knapsack and arms, though able to walk, or unable to carry arms, etc., though able to ride, in the case of mounted soldiers; or unable to ride, though able to carry arms and to walk, in the case of mounted soldiers.

3. *C* class patients: Unable to march in ranks, though can carry knapsacks and arms, or unable to march in ranks, though able to ride, in the case of mounted soldiers.

A class will be carried by carts.

B class are allowed to take off knapsack, arms, etc., and to walk alone or to walk alone leading the horse, in the case of mounted soldiers.

C class are allowed to march alone out of ranks.

15. At the halting place treatment will be given, at a certain time announced, to patients brought by noncommissioned officers, and emergency dressings will be made. The report of patients in the march of the day will be given to the commander.

16. In case serious disease occurs while in march, permission will be obtained from the commander to send the patient to a military hospital or to a local hospital.

17. In case an epidemic disease occurs in march, its management will follow that prescribed by the rules of the locality.

APPENDIX NO. II.

SANITARY SUPPLIES.

REGULATIONS FOR SANITARY SUPPLIES.

(War Act No. 110, October 28, 1899.)

CHAPTER 1.—*General rules.*

1. These regulations have been enacted to insure the proper disposition and preservation of sanitary supplies both for war and for peace.

2. The sanitary supplies contemplated in this regulation include instruments, drugs, and expendible articles both for treatment of patients and for sanitary purposes.

Instruments.—1. Instruments for treatment (inclusive of medical chests, chests for dressings, instrument cases, pouches, chests for drugs, vehicles, tents, etc.). 2. Instruments used for analyses. 3. Appliances used in the preparation of medicines. 4. Articles used for cleaning and repairing instruments.

Drugs.—1. Medicines for the treatment of disease or injury. 2. Drugs for disinfection. 3. Drugs used in making analyses. 4. Nourishment.

Expendible articles.—1. Those used for treatment of disease and injury. 2. Those used for analyses. 3. Those used in the preparation of medicines. 4. Those used for sharpening and repair of instruments.

3. New supplying, when mentioned in these regulations, refers to purchase or manufacture, and repair refers to repairing wholly or in part or with the addition of new parts.

CHAPTER 2.—*Control and preservation.*

4. The control and preservation of sanitary supplies for use in war will be executed as follows:

(1) The division commander will control the war sanitary supplies of his troops. The commander of an organization is charged with the duty of preserving them. The Chief of the Bureau of Medical Affairs of the War Department will exercise control over the main medical supply depot, its chief being in charge of the preservation of supplies contained therein.

(2) The chief of the main medical supply depot is charged with the control and preservation of sanitary reserve supplies for war.

5. In case troops, other military organizations, or military schools require war sanitary supplies for maneuvers or for some other purpose, they will apply to the officer in control of them for permission to use them.

6. Ordinary sanitary supplies issued to troops, other military organizations, or military schools are under the control of the chief of the military hospital, and are preserved by the apothecary officer in charge. The commander or the chief of the troops, other military organization, or military school will appoint a responsible guard for them.

CHAPTER 3.—*Inspection.*

7. Inspections of sanitary supplies will be both ordinary and extraordinary. Ordinary inspections will in great part be confined to examining into the amount, quality, and methods of preservation of sanitary supplies for war. Extraordinary inspections will be made both for war and for ordinary sanitary supplies.

8. Ordinary inspections will be made regularly once yearly by the officers responsible for their control. The War Minister will send censors to make extraordinary inspections. Reports of inspections will be made to the War Minister.

CHAPTER 4.—*New supplies and repairs.*

9. New supplies will be procured and necessary repairs will be made in the military hospitals and in the main medical supply depot.

10. Expenses for new supplies or for repair of sanitary supplies for war caused at maneuvers or by other use, will be paid by the troop or the military organization or military school which has used them.

11. In case circumstances occur so that instruments of the regular pattern can not be supplied, the chief of the military hospital will apply for directions to the division surgeon and the chief of the main medical supply depot to the head of the Medical Bureau of the War Department.

CHAPTER 5.—*Amount.*

12. The amount of war sanitary supplies to be kept on hand will be specially regulated.

13. The amount of ordinary supplies to be kept on hand will be specially regulated.

14. Troops may apply for extra expendible articles after obtaining the permission of the division surgeon.

15. Drugs that are liable to be needed in large amount for the treatment of epidemics will be stored at the military hospitals and at the main medical supply depot.

CHAPTER 6.—*Supply and exchange.*

16. Ordinary supplies for troops, other organizations, and schools will be furnished by military hospitals. Military hospitals will also supply themselves.

17. Drugs and expendible articles will be furnished during the first part of a month. The troop, other organization, or school will find the amount that they will require for the next month and will report it to the hospital by the 10th of the preceding month.

18. Drugs which appear to have changed chemically on delivery will be returned to the hospital from which they came.

19. War sanitary supplies will be exchanged with the ordinary sanitary supplies at such times as the officer in charge of caring for the drugs thinks suitable. The chief of the main medical supply depot will renew them after consultation with the chief of the Medical Bureau of the War Department.

20. (Omitted in amendment.)

21. In case military organizations or schools are closed on mobilization, their ordinary sanitary supplies will be returned to the hospital.

APPENDIX NO. III.

TRANSPORTATION OF PATIENTS.

SELECTION OF PATIENTS FOR TRANSFER TO REAR.

(Injunction, Inspector-General, Field Sanitation, May 3, 1904.)

As a matter of course, troops abroad have great difficulty in promptly filling vacancies, therefore sick and wounded, likely to recover soon, should not be transferred to the rear. Mistakes are occasionally made in respect to this. Furthermore, lack of care on the part of surgeons has resulted in the selection of cases unfit for transfer, in that they were unable to endure the fatigue of transportation, and so died en route.

As a basic principle, the service regulations, of course, forbid retention of many sick and wounded at the front; however, on the other hand, the greatest care must be taken that proper cases are selected for transfer to the rear. Senior surgeons shall instruct and order their subordinate personnel to use due care in reference to this matter.

SELECTION OF PATIENTS TO BE CARRIED BY TRANSPORTS.

(Injunction, Inspector-General, Field Sanitation, February 20, 1904.)

In case patients must be carried on transports, those suffering from contagious diseases, the insane, and serious cases should not be selected for them.

Mistakes made in this particular frequently caused trouble during the Chinese-Japanese war, so that the necessary instructions and due care must be taken to prevent them in future.

TRANSPORTATION OF PATIENTS BY RIVER.

(Injunction, Inspector-General, Field Sanitation, February 27, 1904.)

When a chief surgeon of the lines of communication finds it more convenient to use river transportation for patients, he shall so inform the line of communication commander, in order that ships or boats may be obtained for the purpose. Necessary sanitary personnel, supplies, and equipments will be provided by the line of communication hospital. Proper measures will be taken in regard to the disinfection of ships, etc.

NOTICE ON THE USE OF TRAINS FOR PATIENTS.

(Injunction, Inspector-General, Field Sanitation, February 25, 1904.)

ART. 1. The sanitary personnel to be attached to trains for patients will be arranged for in accordance with article 182 of the medical service regulations in time of war.

ART. 2. The sanitary supplies provided will be the ordinary medical chests, dressing pouches, litters, and other equipment which may be necessary.

ART. 3. Beds will be prepared for patients who need them.

ART. 4. The above-mentioned personnel, supplies, etc., will be dispatched from the hospital from which the patients come.

ART. 5. The division surgeon must give the necessary instructions in regard to sanitary personnel, supplies, and transportation for patients to the hospital director and other surgeons concerned.

ART. 6. The sanitary personnel detailed may give advice in regard to heating of cars and equipments for them, to the commander of railway line.

INSPECTION OF HOSPITAL TRAINS.

During the time spent in Japan a great number of trains carrying wounded and sick were seen. The following description of an inspection made in January, 1905, gives the characteristic features of such trains:

HOSPITAL TRAIN, HIROSHIMA.

The cars devoted to hospital purposes on this train, which is an ordinary one, are 4 in number. The two front ones are third-class coaches, in which mild cases sit; the next is

a second-class coach, in which 8 rather more severe cases lie crosswise the whole width of the seat, with an unoccupied seat for the surgeon at one end. Very bad cases are in an altered third-class coach next back of this; this is fitted with bunks, much as are ships, 2 bunks in a tier, 32 in all. Several small ladders are provided, by which patients can reach the upper berths; only 1 berth is used if the cases are very bad. Thirty are occupied. A seat is left at the end opposite the closet for the nurses; the closet has not been changed. A large side window is cut through the corridor in the middle, through which litter cases are passed, but special short-handle litters have to be used, and there is much difficulty then in handling the patients. The frames for the bunks and the bunks themselves are just like those on hospital ships, except that they are smaller and not so strongly built. The mattresses and bedding are of the usual description. The personnel of the train consists of 1 surgeon lieutenant, 1 chief nurse, and 4 employed nurses. No food is carried in this instance, and the surgeon has only a few simple medicines in a small wooden box. Red Cross parties at all the principal stations furnish most of the supplies for the patients. At the Hiroshima station, the rest station of the Red Cross consists of 2 tents, with seats, etc. Tea only is supplied the patients, as they come directly from the hospital. There were 59 light cases and 38 severe ones in the 4 cars. The cars are heated by the usual hot-water cans.

INSPECTION OF HOSPITAL SHIPS.

A number of different hospital ships were inspected, both those of the army and of the Red Cross, and my trip from Ujina to Dalny was made in a hospital ship. In order to save time, the description of the results of these inspections will be considerably abbreviated. During the war Japan operated 20 hospital ships, 18 belonging to the army and two to the Red Cross. Most of these came to Ujina, the port of Hiroshima. Dalny was to be used mainly for the embarkation of patients, but some ships were taken of sufficiently light draft to go up the river to Yingkou.

The *Yokohama Maru* may be taken as typical of the army hospital ship. She is a merchant steamer, belonging

to the Nippon Yusen Kaisha, and has been little changed for her present purpose. The chief medical officer had seen the *Relief* and went to great pains to explain to me that they believed her to be the model that should be copied, but that they required no such elaborate equipment. "The *Relief* might be described as a floating hospital, while these ships are hospital transports pure and simple." On the *Yokohama Maru* the worst cases are put in the cabins, 2 patients, or only 1 if the man is very ill. Temporary bunks have been put in the dining saloon, in an open space forward on the main deck, and the between-deck space has been utilized in the same manner. This vessel is 3,000 tons register; this gives space for about 300 patients. Heavy wooden uprights are put in, with iron braces above and below, and the bottom berth is bolted to the uprights with 2 large bolts, the upper resting on a wooden cross-piece. The bunks themselves are simply wooden boxes, heavily built, about 5 feet 9 inches long, and 2½ feet wide; they are about 6 inches deep, and on this ship were hinged in the middle so that they drop apart longitudinally for cleaning. There is no ventilation except by the ports. The contagious diseases are isolated below forward, and this part of the ship is separated further aft by a bulkhead so that communication is prevented with it. On the upper deck they have a large and good sterilizer, housed, and a mortuary; these are also forward, and the deck space aft is ample. The ship's galley and the cabin galley are used for the preparation of food. The steward's room has been taken for a dispensary, and 2 small rooms on the main deck, with a skylight, have been taken for an operating room and an operating storeroom. There is a small steam sterilizer for instruments and dressings, which is supplied with steam from the boilers. They have a metal operating table and some metal irrigators hung on the wall, and a small supply of instruments and splints. There is said to be no attempt to operate, except in emergency cases. They are very proud of their method of sterilizing all clothing, which is put through the sterilizer, remaining there for one hour at 12 pounds pressure, and claim that by this means they have been able to prevent the importation of infectious diseases into Japan. The introduction of such diseases was a prominent feature in the Japanese-Chinese war.

Patients, if they have not already received the hospital dress, get it on the ship, and their clothing, sterilized, is sent on shore, where it goes to their division headquarters. The master of the ship, a merchant captain, still acts in that capacity, the port authorities, who control him, holding much the same position toward him that the shipping agents of his line would in time of peace. He is directed to make certain trips and is just as independent as a merchant captain in time of peace. The medical personnel and patients are practically passengers. In this ship at least apparently there was absolute harmony. It must be remembered that the Japanese have succeeded, to an extent not often acquired by other people, in sinking all petty differences during the war. The medical personnel consists of 1 military surgeon and 1 chief nurse to look out for the administration, 2 Red Cross parties, 11 men and 33 women Red Cross nurses, 4 Red Cross doctors, and 2 apothecaries. The crew of the ship, total, is 72, and the surgeon stated that he had only to ask to obtain any needful assistance from any of them.

On the same day an inspection was made of the *Kanagawa Maru*, a 2,800-ton boat of light draught, intended to run to Yingkou in the summer; she now goes to Dalny. She is a cargo boat, with all her wards on the main deck. The women nurses are also aft on this deck in one compartment, pretty close quarters, though big enough. There is excellent head room in this ship, and, though she is a very old craft, it is thought that patients would probably be more comfortable than on the *Yokohama*. Everything else, including the personnel, is the same as on the latter, except that she carries 338 sick, and the cabins are neither so good nor so numerous, nor is the deck space as large.

Date of inspection of the *Rohilla Maru* was from February 2 to 7; length, 384 feet; breadth, 49; depth, 29; gross tonnage, 3,386; net, 2,174; carries 450 patients; 6 wards, 1 in dining saloon; contagious-disease ward forward; personnel consists of, army, 1 major-surgeon, 1 chief nurse, 6 Red Cross doctors, 3 apothecaries, and has 3 parties, consisting in all of 55 women nurses and 10 men; there are 90 in the crew. In the forward well, on the main deck, small temporary wooden houses have been erected for closet, kitchen, and sterilizer; aft, on the upper deck, a

mortuary has been built. The bunks are constructed as on the *Yokohama Maru*; there are some double bunks which are only used, however, in the case of the greatest crowding. Excepting the ward in the dining saloon and the other, most of the wards are in the between-deck space, on which the women nurses are also located, aft. The women have large bunks for three persons, but each has a separate bed made. The cabins are used for the more serious officer patients, for whom and for the personnel baths are available, but there are none for the patients. The operating room is made by throwing two cabins together on the saloon deck. Like the *Yokohama Maru* a small adjoining cabin is used for dressings, etc.; another cabin is devoted to the office. The hold is used as a ward, and the floor and sides are boarded up. The other wards have wooden floors on the iron decks. This ship has an English master, and the crew, engine force, etc., is the same as it is when engaged in passenger traffic. A portion of the hold is also used for the supplies of the ship, but, as usual, other supplies are not transported. The saloon galley is used for the staff and the officer patients; but as this is not large enough it is supplemented by a small galley on the upper deck. Rice is cooked in an improvised temporary kitchen in the forward well; this well is much crowded by numerous temporary structures and is always flooded in a seaway. This makes it very bad for the cooking, and men going forward are apt to get soaked. Before landing at Dalny the beds were all prepared with bedding, kimonas, and pajamas, and everything was as clean as possible in such an old ship. The women nurses take a large part in policing wards, etc., doing much more of the heavy cleaning than do our nurses. The ship is decidedly faulty in its lack of bathing facilities for the patients, and no method is provided for heating the wards. With the Japanese method of shipping patients to the rear so rapidly, men often do not receive much surgical attention until they arrived on a hospital ship, and it seems to me that it would have been perfectly practicable to have had an operating room in which all operations could have been conveniently made; also the general Japanese fault of having but one room for operations and dressings is deserving of criticism. There are no methods for distilling all water in any of these hospital ships, so much water is

obtained at Ujina. A special pipe line has been put down for this purpose, and water boats are necessarily used. It should be mentioned, further, that the chief surgeon of the *Yokohama Maru* is a major and of the *Kosagawa Maru* a lieutenant colonel, both at present being unfit for service at the front. None of these ships carries supplies except their own; it is stated that it would be inconvenient to have them do so, as this would delay them at Dalny.

The two hospital ships owned by the Red Cross Society are somewhat better fitted for their purpose than are the ships of the army. The Red Cross ships, the *Kosai* and the *Hakuai Maru*, are sister vessels; each is 2,600 tons net. They were built on the Clyde in 1899 and bought there by the Red Cross. As they were intended for passenger steamers they do not fill the requirements of hospital ships perfectly. Their speed is $13\frac{1}{2}$ knots; the crew consists of 80 men. They are docked once yearly, and boilers are cleaned every three months. Both ships are run entirely by the Red Cross, which pays all the expenses. The personnel consists of 4 Red Cross surgeons, the chief having the relative rank of colonel, 3 apothecaries, 1 instrument repairer, 1 barber, 11 men nurses, 33 women nurses, 1 secretary, and 2 clerks; total, 56. (This was the personnel actually on duty on the *Kosai Maru* at the time of my inspection of that vessel on September 19, 1905.) At this time the *Kosai Maru*, in service since the beginning of the war, had made 46 trips across to China, the greater number being to Dalney, and had carried 11,000 patients. She has 223 bunks, but can carry 300 sick and wounded. It chanced that I had traveled as a passenger on this ship some three years before, when she was in the service of the Nippon Yusen Kaisha, so that I was able to appreciate exactly what changes had been made to adapt her for a hospital ship. The upper deck was exactly as when she was used in the passenger service, the smoking room and saloon not being altered. On the main deck a dining saloon aft has been cleared of tables and chairs, and when there are many patients they are placed on bed sacks on the floor here. The cabins communicating with this saloon have 33 bunks for officers; these bunks have tubular iron frames, with woven-wire spring bottoms; the upper berth turns up; the outer berth is a sofa. Midship cabins are used for medical

officers' quarters, engineers, and ship's officers; a small ward for 6 serious cases is found here, as is a room for X-ray work, a room for the storage of dressings, through which the operating room is entered. The latter is a room about 16 by 8 feet, with one fixed table and a steam sterilizer. The surgeons' principal objections to the boat are the extremely narrow passage-ways, which make the handling of litters difficult. Forward of the midship section is a large port for unloading patients; forward on the deck is a large steam sterilizer which opens at both ends, so that infected and clean articles need not come into contact. On the main deck aft are the quarters for nurses, one-half the width of the boat, the other half being empty for store room. Immediately forward of this the ship is again divided into storeroom and refrigerator, next which is a small room for bodies. In the midship section are also a few cabins opening on deck; these are used for stores and offices; the cabin galley is used for officers. The officers' cabins, mentioned as communicating with the dining saloon, have communicating doors between them, which are closed when the ship is used for passengers and opened for a hospital in order to make attendance easier. The steerage, forward, between decks, is used for patients; this has 2 compartments aft, accommodating 131 patients, and forward, 26. The forward compartment also has 1 bunk in a cabin; this is intended for infectious diseases, a door separating it from the other compartment; it also has separate closets in the companion way. Below, in the main compartment, on the next deck, are 26 bunks; this space is seldom used. The bunks all have tubular iron frames and spring bottoms made of crossed pieces of flat metal; the frames fit into an opening below; there is a cleat above, so that they are easily removable. In peace times the frames are stored by the Red Cross. The bunks are not well arranged, as they are in sets of 4 wide, and, at the sides especially, it must be almost impossible to reach the patients. Soldier patients get their food from the steerage galley. The boat was coaling at the time of my inspection, and, with all due allowance for this, its paint was very dingy.

At the time of my inspection of the *Kosai Maru*, there were 19 hospital ships actually in commission. Some of these were running to Gensan and Sakhalin.

EXPERIENCE WITH LITTERS IN THE JAPANESE ARMY.

[Translation from a Japanese medical journal.]

"Three kinds of litters were in use—the Annan, the old form with no legs, and the new with legs. The litter with legs has not proved very strong; its weight is 2 kwan.

"In a certain sanitary company 5,445 wounded have been transported by bearers; 4,083 of these have been carried on 80 litters of the new type, with legs, and the distance which each has been transported has averaged 2,000 meters. One litter has therefore gone 2,000 meters 100 times. During their service these litters have been wet with rain and injured by cold, wind, and heat; they had no covers. The parts worn-out from the 24th of May to the 31st of December were as follows: Eighty-eight bamboo poles totally; 99 bamboo poles have cracked and are weakened, but are still usable; * 55 cloth bottoms were totally worn out, 56 legs were broken or worn-out, 54 slings were worn-out, and 21 braces. Experience shows that 20 per cent of bamboo poles must be carried in reserve; the loss by wear and breakage never exceeded that percentage.

"In making new litters the following points should be observed: (1) They should be light and strong. (2) They should be convenient for carrying. (3) They must have legs. (4) The beds should be longer and wider. (5) A khaki-colored water-proof cloth should be provided to protect the patient from rain, snow, or sun. (6) Wooden poles would be better than bamboo, but a good quality of wood must be chosen for them. (7) The cloth must be better material, and the thread must be stronger; there should be two or three rows of stitching."

HORSE LITTERS.

The following is a partial translation of an article on horse litters which appeared in a Japanese medical journal. A much better idea of the litter can be gotten from the illustration than from the text.

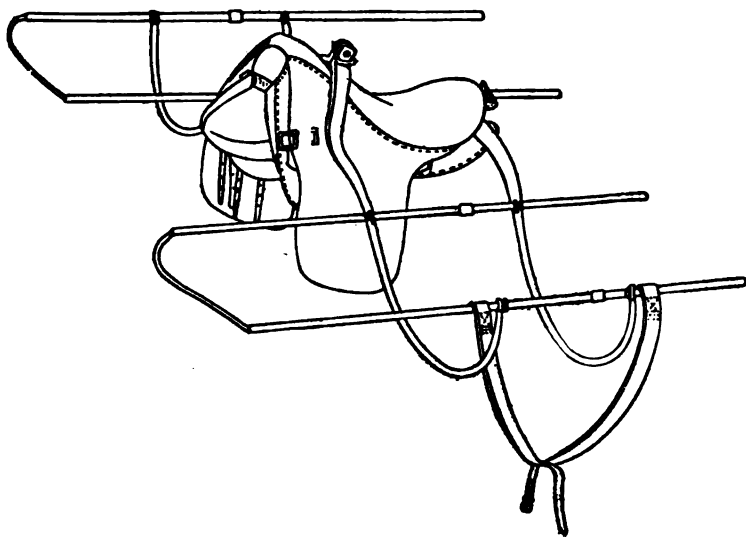
* Extra poles were supplied, and all that had been used six months were worthless.

"A horse litter was used in the Third Regiment, one being issued to each squadron and two being kept in reserve. It has proved a rather satisfactory piece of equipment. The frame is made of Swiss iron and canvas and may be taken to pieces when not in use. The pieces may be carried on an ordinary saddle. When stretched open alongside a horse this litter looks like the ordinary type hung from the animal, and it is intended that wounded should be taken on both sides, and that their heads should be toward the head of the horse. It was found very difficult to use it with only one wounded man, so that in practice a well soldier was placed on the other side to care for the man injured, but when necessary the equipment of the wounded man might be used to balance his weight. When these litters are folded they do not take up much space and may be carried by several troopers. The litter may be placed in position in eight minutes. Its weight is about 5 kwan and its cost about 20 yen. It has four parts—the frame, the poles, the bed, and the leather belt."

Further remarks on this horse litter were made by Surgeon Ito, who apparently had some experience in their use at the battle of Liao Yang. They are to the following effect: "In an independent cavalry action at Liao Yang seven casualties occurred, but as only one horse litter was on hand, all these wounded men could not be carried thereon. Two carts were therefore requisitioned for the others. The horse litter was only used twice in the battle of Liao Yang, but was also employed in march for carrying sick to the rear."

Surgeon Ito made the following conclusions: "(1) Such a vehicle is necessary for independent cavalry without vehicles. (2) As no supplies are on hand with cavalry commands, wounded must be carried to the rear. (3) As the horse litter does not require as many bearers as other litters, it is convenient for cavalry which is deficient in personnel. (4) Horses of wounded troopers may be used for it, and it can be placed on the ordinary saddle without difficulty." His objections were: (1) It can only be used for two wounded, as it will not balance with one man. (2) The litter weighs about 5 kwan, so that the weight is excessive for a horse, and in consequence he must go very slowly. (3) Difficulty was experienced in using the litter when the road was steep, rough, or muddy."

Horse Litter *Plate 5*



Sections.—This hospital has the usual sections prescribed by regulations and treats insane as well as contagious diseases.

Administration building.—This is a building of the same style as the wards and requires no particular description.

Wards.—The wards are the single-story pavilions of two epochs. In the earlier ones the pavilions are not raised so much above the ground and do not have passageways connecting them. Those are about 20 years old. Those built about the time of the Chinese-Japanese war are elevated about 3 feet on brick foundations, and the space beneath the floor is ventilated with screen ventilators. They are connected by roofed passageways, and all have narrow porches running along each side. The wards are wooden, plastered outside, and the walls support tile roofs; elevation of the peak of the roof is about 27 feet above the ground. Inside they are ceiled and plastered; the plaster is very dingy in places, though not broken. The wards themselves are about 36 feet long and 18 wide. Some of the wards have small rooms for very sick patients at their outer ends, being built longer for that purpose. The building for officer patients is of the same construction as the wards, but is divided into small rooms. Officers of high rank each have a room, but other rooms contain two or three officers. The wards have glass windows, with glass transoms above them and sliding glass ventilators below. Each ward has two stoves, but though it was fairly cold, from 45° to 50° F., none of them was heated, and everything was open. The arrangements of the central sections of the pavilions were the same; a central passageway about 15 feet wide with four small rooms at the corners, one for the surgeon, one for the attendants, one for the woman nurses, and one for heating water. The wards are lighted by electricity. Most of the beds in this hospital are of iron, thin iron strips forming the springs. Each bed has a small shelf at the head on which is stored all property which the patients are permitted to take into the wards. In addition, there is a small iron rod on each bed on which is hung a wooden tag giving the patient's name, the diagnosis, etc. The color of these tags differs. In those who can walk it is black; in those who are not entirely

helpless it is red, and in those who must have everything done for them, white. The patients are more crowded in the wards, which have 48 beds, than we like to see them, the beds almost touching each other, but as everything is open the wards are very well ventilated, at least in the day time. Individual wards are separated by a greater distance than in temporary hospitals, generally 60 feet intervening between each two. In the rear of the hospital grounds is the isolation ward. It is perhaps 150 feet from the nearest ward containing noncontagious cases. In the isolation ward 20 cases of typhoid were under treatment. No other contagious diseases are in the hospital except beriberi and phthisis; the former is not isolated at all, and the latter has a separate half ward. The regulations state that the women nurses shall not be used for cases of infectious disease, and the hospital director told me that it was the first case in which they had been so used. All the women nurses are from the Red Cross. Until a recent law was passed allowing them a pension in the event of their death in line of duty they received nothing. The chief nurse told me, with a good deal of professional pride, that the men nurses died so rapidly that they had to use the women. The chief nurse seems to be very competent, and the women nurses as a whole are very good for Japan. The hours for nurses are peculiar. They come on duty in the morning for twenty-four hours, but at night—that is, from 3. a. m. until getting-up time—only two are on watch, the others resting as best they can in the nurses' room. Five are on duty daily in the 48 bed wards, so 10 are required; not very economical.

Bathing and closet facilities.—At the outer ends of the wards are the usual closets and bathrooms in a small narrow building with a cement floor on a level with the ground. Water is laid on, but the closets are the ordinary cess pits and smell badly.

Disposal of wastes.—Typhoid stools are disinfected and put into a large receptacle which is emptied into a crematory once daily. The contents of the ordinary closet are removed once in twenty-four hours by contractors who use them to fertilize the fields. No disinfectants are used with them, as these would destroy their value. Bedpans are provided

liberally for use in the wards, but all are of a bad shape; the best, of metal, have too steep a slope, and others are like an oblong eighth barrel in which the patients have to sit up.

Dispensary.—The dispensary building requires no particular description. A large personnel is required, as many of the analyses of the drugs for the branch hospitals, as well as for this institution itself, are made here. In the dispensary there is rather a neat arrangement for dispensing the commoner drugs. A circular stand has a number of glass receptacles set around in a frame above a sink. These contain the commoner medicines and are controlled below by a glass stopcock, so that by simply turning this the required drug is obtained without having to get down a bottle. As usual in Japan, milk was being prepared in the dispensary in little four or five ounce bottles which were all sterilized for three minutes at 100° C.

Operating room.—The operating room is on the ground, with cement floor. It has very simple meager furniture. Here, as at the other Japanese home hospitals, operating tables with hot-water receptacles for warming are used. This is the more necessary, as the operating rooms are rather cold. The operating room is furnished with steam from a central plant, which also supplies steam for the sterilizer and to boil water. There is no separate dressing room. In connection with the operating room is an excellent room for X-ray work, and some good X-ray pictures are exhibited as are also many specimens of foreign bodies removed from wounds.

Sterilization and preparation of dressings.—There is a fair-sized sterilizer in the operating room which is said to supply some dressings for the branch hospitals. Dressings are washed, sterilized, and reused.

Kitchen and preparation of food.—The kitchen receives steam from the central plant. It was the usual ground-floor room with stone floor. All food is boiled as is the common custom in Japan, and this much simplifies cooking. Civilian employees are exclusively used as cooks. Food is usually taken to the wards by the nurses.

Storerooms.—These were not seen, as they were said to be in great confusion as issuing was going on.

Sterilizer for bedding and clothing.—This is a single skin, iron chest with a heavy iron door which locks. It is not in any sense a steam sterilizer, as the steam pipes merely pass through, it really being a hot-air apparatus. The temperature is raised to 100° C. for two hours, but it seemed doubtful to me if this method would be effective, more especially as an attempt is made to sterilize thick cotton mattresses, which are very hard to penetrate.

Police.—As is usual in Japanese hospitals, the police is excellent.

Methods of transportation of patients to hospital.—Almost all by rickshaw; very few by litters.

Methods by which patients are transported in hospital.—This hospital covers a small area, and therefore patients have to be carried very short distances. This is all done on litters by civilians.

Where patients are sent from hospital.—Patients may be returned directly to duty from here or sent to convalescent camps. Rarely patients from other divisions are taken in Tokyo. In such cases they might later be returned to their own divisions.

Remarks.—As this hospital is the principal hospital of the division, all patients arriving in Tokyo are reported to the hospital director, and he has daily records of the vacancies existing at his branch hospitals which he notifies to send for the patients. Those sent to the convalescent camps are also distributed under his direction. As this is the first hospital reported upon, a word must be said in reference to the records. The Japanese have high skill in making records. The most important hospital ones are the daily history sheets, which are begun on the field as soon as possible, the diagnosis tag being attached to the patients until they are started. The exchange usually takes place in the field hospital, and then the original daily history is brought back through the various stages to the hospital of the man's own division at home. A specific man is made responsible for it in each stage of the journey. The daily history is gradually added to with pictures, temperature charts, drawings, etc., and is a complete record of each man's case.

SHIBUYA HOSPITAL.

Dates of inspection, December 21, 1904, January 8 and September 27, 1905. Class of hospital: Branch hospital of the Tokyo reserve hospital. Class of cases treated: Officers, noncommissioned officers, and severely wounded or seriously sick privates. The hospital director is an ophthalmologist, and the greater part of the eye cases in Tokyo are sent here. Whence patients come: From front and also from organizations and divisions in Tokyo. Branches: Is itself a branch. Location, Shibuya district, Tokyo; capacity, at the end of the war about 4,500; number of patients present at date of inspection in January, 3,265; in September, 1,800.

Personnel.—At date of first inspection about 50 surgeons, including Red Cross surgeons and army surgeons on probation, 1 intendance officer, 24 apothecary officers, about 25 medical noncommissioned officers, 10 noncommissioned intendance officers, and about 600 civilian nurses, 100 civilian laborers, about 125 Red Cross nurses. The following is a detailed statement of the personnel at the date of the last inspection in September: Surgeon lieutenant-colonel, 1; pharmacist major, 1; surgeons captain, 6; pharmacist captain, 1; intendance captain, 1; surgeons lieutenant, 2; surgeons second lieutenant, 9; pharmacists second lieutenant, 14; chief surgeons of the Red Cross Society, 2; surgeons of the Red Cross Society, 11; pharmacists of the Red Cross Society, 6; surgeons on probation, 11; sanitary noncommissioned officers, 23; noncommissioned intendance officers, 10; employees, 63; clerks of the Red Cross Society, 6; chief lady nurses of the Red Cross Society, 11; lady nurses of the Red Cross Society, 114; nurses, 364; total, 656. It is not believed that all personnel is included.

Sections.—This hospital has the four sections prescribed by regulations, one of which is devoted to the treatment of contagious diseases.

Administration buildings.—This hospital is on the site of the permanent Red Cross hospital, which is conducted by that organization in time of peace, but is turned over to the army in war. The administration building of the Red Cross is a large two-story brick structure, but at the time of my inspection this was not really used for the administration

building of the hospital, although there were some reception rooms and offices in it. The military hospital administration building was a wooden ward divided into different offices by partitions.

Wards.—As stated, this hospital consists in part of the Red Cross hospital, so that the permanent wards of this establishment are utilized as well as those of a temporary character built for the war. Running back from the administration building are two corridors inclosing a court. These have stone foundations and tile roofs, with sliding glass windows inclosing them completely at the sides. Running out from them at nearly right angles are the permanent wards for pay patients in time of peace. These are strongly built of stone, with tile roofs, and they each have a corridor in front of their whole length which gives access to them through their doors which open into it. In addition a number of other wards of the same solid construction have been erected. Some of these are devoted to the section for contagious diseases and others are for the care of noncommissioned officers; they are of the usual pavilion type.

The wooden barracks, some of which are said to have been erected within three days, are reported to be 49 in number; these constitute the greater part of the hospital. The general plan of these wards is the same, a central elevated passageway, roofed, running through from front to back, with wards on each side. The wards are very close together, however, so that the roofed passageway between two adjoining ones is short, not more than 25 feet. This brings the wards entirely too near one to another, according to our ideas, as they cut off the sunlight from the intervening ground, which is damp. At the time of my first visit, though all the snow from the recent storm had disappeared from the city, there was some lying between these barracks. The individual wards are not far from 100 yards long. They have tin roofs, under which are layers of hay plaited on bamboo poles. The walls are of pine, with numerous sliding windows of glass. The elevation of the wards to the peak of the roof is about 30 feet, and they are raised about 3 feet off of the ground, with screen openings for ventilation underneath. The main wards are subdivided into three. At the center of the passageway, on either side leading into the

ward, are two rooms—that is, four in all—one for the surgeon, one for the men nurses and for stores, one for the women nurses, and a room for heating water. At the outer end of each ward is the lavatory and toilet room. The wards themselves are about 20 feet wide. These toilet rooms are 4 feet less in width and 12 feet long. They are at ground level, with cement floors, and have a screen in the middle separating the baths from the closets. The wards are nicely ceiled; this and the felting of the roofs with hay tends to make them warmer than they would be otherwise, but as they have no means of heating except by an occasional hibashi they would be very cold for an European.

Some of the wards have the passageway on one side instead of the middle, as the ground can be sometimes better utilized in this way. The beds are wooden bunks placed about a foot and a half apart; the bedclothing is that described in the regulations. Each bed has the shelf for the patient's effects permitted in the ward. Each main ward is said to have a capacity for 70 patients, though but 54 beds were counted. As this hospital is in an elevated district of the city which is not much built up it has unrestricted light and air. The site is a little less than a mile long and about a half a mile wide, and the hospital occupies all of it. At the time of my visit there were about 20 typhoid cases and a few dysentery patients under treatment. The wards for them are well separated from the other sections of the hospital. As has already been mentioned, officers are housed in the permanent pavilions of the Red Cross hospital. The rooms here vary much in size. Officers of low rank are much crowded in them, even as many as five or six being in the same room, but those of the rank of major and above are not more than two in a room, and general officers have separate apartments. These rooms are very comfortable, with iron bedsteads, and are heated by stoves. The majority of officers have all sorts of their own baggage in their rooms with them. The officers receive free treatment from the hospital, but they usually elect to buy their own food. The wards are lighted by electricity. At the time of my last visit about 50 per cent of the cases under treatment were beriberi.

Bathing and closet facilities.—Water was laid on for the baths, but there is no sewage system, excreta being received

in adjoining cess pits, from which they are removed by contract. The closets have the usual foul odor of the Japanese closet. No flies were seen in them.

Dispensary.—The dispensary is located in a building of the same temporary character as the wards. It is a large room, much larger than we would devote to the same purpose, and many assistants were very busily at work. This is necessary, of course, as tablets are not in common use.

Operating room.—In the permanent Red Cross building there are two very good operating rooms, which are used for the more serious cases, for which a noted surgeon from Tokyo is frequently called into consultation. There is also a temporary operating room in one of the ward sections, the building being very similar to the wards, though not elevated above the ground. It has cement floors and consists of three small rooms. The operating room proper has two tables of metal. There is a smaller room where instruments and dressings are sterilized and another room where clothing is hung and a few specimens are kept. The operating furniture is fair of its class, but is what one would expect to see at a military hospital in the United States where transportation limited supplies to the barest necessities. This operating room is used in the morning for every class of operation, and in the afternoon all cases requiring it are dressed here. It is understood that only instruments and part of the dressings are sterilized at the Shibuya, the main hospital supplying some of the latter. It would seem that this would be necessary, as the plant here is a very small one, though it could possibly furnish enough by working many hours a day. The specimens of projectiles are interesting. They have a number of bullets deformed by ricochet, fragments of shell and shrapnel, also jackets from bullets; several pieces of clothing which have been removed from infected wounds are also exhibited, among others, three pieces of a 5-yen note which had been carried into the abdominal wall of a soldier in the attack on Port Arthur, the projectile being a rifle bullet. These specimens were nicely mounted on small cards, which gave a short history of the individual cases. The cards were filed in a small wooden frame with separate compartments for them. It was

noticed that gauze bandages were being washed in a small shed adjoining the operating room, and information was received that this was the usual practice as a matter of economy, the bandages being resterilized before use.

Kitchen and preparation of food.—Separate kitchens are provided for each section, and there is no communication between that for the contagious diseases and the other kitchens. Except that each kitchen has its own fires, the remarks made in reference to the kitchens at the principal hospitals apply here.

Storerooms.—One small storeroom—a wooden building—is supplied for each section.

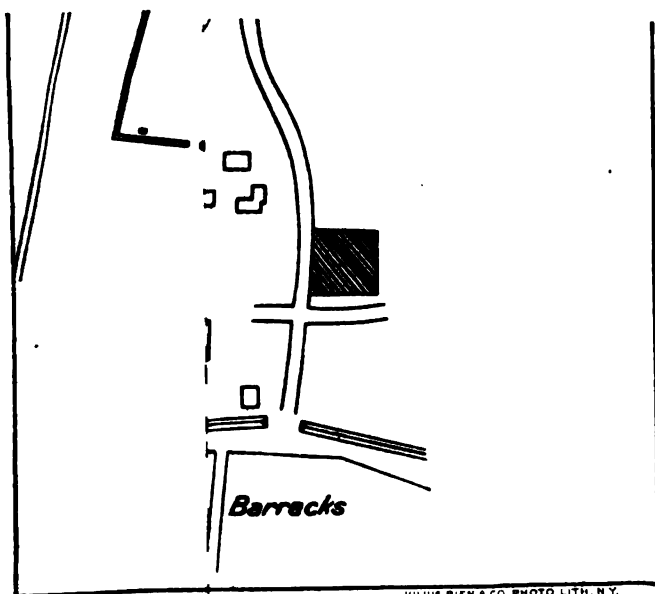
Canteen.—There are canteens for each section, except that for contagious diseases.

Police.—The police is very good here, but not as perfect as in Japanese hospitals usually. This is rather strange, as this establishment is the hospital which is always exhibited to visitors.

Methods of transportation of patients to hospital.—Almost all by jinrikisha; very few by litters.

Methods by which patients are transported in hospital.—All by litter. As the area which the hospital covers is large a long distance must be traversed to reach the operating room.

Remarks.—As has been stated, this hospital consists of buildings of the Red Cross, which retains two wards for the use of the poor during war. A large theater, to which actors from Tokyo give their services gratuitously, has been built here by the munificence of Baron Iwasaki. The cost of this is said to have been 20,000 yen. During the war the Red Cross authorities were building a large central steam plant for this hospital, planning to use it to heat the permanent wards and for other purposes. It was about completed at the time of my last visit. As stated, the director of this hospital is a specialist on diseases of the eye. He apparently gave the greater part of his attention to his professional work, and perhaps in consequence the administration of the hospital was not as good as in the Japanese military hospitals generally. The senior apothecary officer, who spoke a little English, accompanied all visitors around the hospital.



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TOYAMA HOSPITAL.

Date of inspection, January 8, 1905. **Class of hospital:** Branch hospital of the Tokyo reserve hospital. **Class of cases treated:** No officers; noncommissioned officers and privates; the greater number of patients are medical cases. **Whence patients come:** From front and also from organizations and divisions in Tokyo. **Branches:** Is itself a branch. **Location:** Toyama district, Tokyo; capacity, 4,500; number of patients present, 3,900.

Personnel.—There are no women nurses here. During the coming week it is intended to utilize the services of some prominent civilian physicians and surgeons from Tokyo who have offered to help. These gentlemen have an idea that by doing so they may replace some of the staff and allow them to go to the front, but as it is understood they are to continue to practice in town, only coming out to the hospital for about two hours each day, while their experience may be of value in the way of consultation, they will not add materially to the working force employed in the actual running of the hospital.

Sections.—The hospital has four sections, each with a major at its head, and a major is in command of the whole hospital. These sections are two medical, one surgical, and one receiving and forwarding. One of the medical sections has the typhoid and most of the severe beriberi cases, so in reality it might be called the infectious-disease section. The receiving and forwarding section uses some old barracks, which were not occupied for some time before the war. Each section is quite separate in itself, with its own little office, dispensary, storehouse, etc., and the individual sections are separated by long distances, so that the hospital as a whole occupies a great deal of ground.

Administration buildings.—The hospital, with the exception of the old barrack buildings, is one wholly constructed for the war, and the administration buildings are of the same character as the temporary wards described at the Shibuya Hospital, with partitions to cut them up into offices of convenient sizes.

Wards.—The wards are on the model of the Shibuya. Each ward, that is each complete ward, by which term the Japanese designate the two wards on both sides of the passageway with the bathrooms and closets, is about 300 feet long. They have the same fault as the Shibuya in being built too close together, not more than 25 or 30 feet separating them. All have roofed passageways connecting them; that is, all except the old barracks. Each ward contains 142 patients, and bad cases are removed to small rooms. Hibashis are the only means of heating, but though the day was cold patients were wandering about in the hospital dress, and some were seen without the trousers of their flannel pajamas sitting on the hills where quite thick ice had formed on the little puddles in the vicinity.

Dispensary.—There is a main dispensary, which is a large temporary structure. The chief apothecary officer told me that each of his assistants put up about 102 prescriptions daily. They have shelves outside the dispensary on which the medicines are placed as soon as compounded, so the chief nurses of the different wards may take them out at any time. The subordinate personnel of the hospital occupies vacant wards.

Operating room.—The operating room was of the same type as the one described at the Shibuya, but many cases were being dressed in a ward which had been converted into a temporary dressing room and also in one of the rooms of the little operating building, which was divided into 4 rooms. The main room, as far as possible, was used for operations only. At the time of my visit a man with an infected wound of the hand was on the table under chloroform. His injury was the result of a shell wound. His general appearance was not that of a man suffering from a severe sepsis. The surgeon was preparing to open the wound freely. They also have an X-ray room here and show some excellent pictures.

Sterilization and preparation of dressings.—(See Shibuya.)

Kitchen and preparation of food.—The same as at Shibuya. A noon meal was in course of preparation at the time of my visit. It consisted of rice, and the *sai* was boiled meat, sweet potatoes, and a cake made of beans.

Storerooms.—One to each section. These were well arranged.

Canteen.—Canteens are operated for each section, except the contagious disease.

Police.—Excellent.

Remarks.—The laboratory, while not large, was well equipped and had facilities for making cultures, etc. The mortuary contained two bodies—typhoid fever cases. It was built like the wards, but had a cement floor and separate rooms for each body. Baron Iwasaki built a small theater here also.

HIBOWO HOSPITAL

Date of inspection, January 10, 1905. Class of hospital: Branch hospital of the Tokyo reserve hospital. Class of cases treated: Both wounded and sick, but no infectious diseases. Branches: Is itself a branch. Location: Shibuya district, Tokyo, very near the hospital of that name. Capacity, about 1,900 patients, crowded; present number of patients, 1,860.

Sections.—The usual four of the Japanese regulations, but they were so crowded at the time of my visit that it was impossible for them to run a receiving and forwarding department, and the patients arriving or those for departure were mixed with others in most of the general wards.

Wards.—(See Shibuya.) Their construction is the same as that hospital, but the individual wards are even closer together, not more than 20 feet apart, and they are also shorter than there, the half wards having but two sections and with the closets being only about 120 feet long.

Kitchen and preparation of food.—The kitchen was of the usual type and had in course of preparation the most ample meal seen. There was a very large piece of fish on each plate with the usual bean cakes and sweet potatoes.

Storerooms.—Only those sufficient for current needs; well kept. Blankets are used in this hospital to some extent to replace the usual futon.

Police.—The police was excellent.

Remarks.—Rather a young captain is acting director of this hospital. No intendance officer is stationed here, but two

noncommissioned officers, who receive some directions from the intendance officer of the principal hospital.

HIKAWA HOSPITAL

Date of inspection, January 10, 1905.

This hospital is located in another district, but does not vary from the general type in construction. Its buildings have roofs of shingles, like Toyama, with the bamboo strips crossing to hold them down, instead of tin roofs with the straw underneath, like the other two large temporary hospitals at Tokyo. The police here was not quite as good as is customary at the Japanese military hospitals. The dispensary was especially well arranged, and the surgeon in charge, a young captain, had improvised a room for massage, which is extensively practiced in all Japanese hospitals. A medical officer, representing the chief surgeon of the division, was inspecting at the time of my visit. This is one of the duties imposed on the division surgeon's assistants or, as in this case, on other surgeons of experience in the division.

The canteen was visited. It was really a sutler's store, a merchant being allowed to run it, his prices, hours, etc., being fixed by the council as provided in the regulations. They had a number of articles on sale—a few things to eat and purses, bags, mufflers, etc. It was apparently well patronized. They have no women nurses in this hospital, but they have in the Hirowo, which has just been described, they coming on duty at 8 and going off at 5 in the daytime. There were 1,673 patients in this hospital at the time of my visit. It was crowded with that number. There were no infectious diseases. The hospital has the same faults as the others just described in that there is not enough space between the wards. Two noncommissioned officers of the intendance department are stationed here. As at all the other Japanese reserve hospitals, the liberality with which civilians were hired for necessary purposes was noteworthy.

At the time of my inspection of the Tokyo hospitals in January, 1905, the German Red Cross Society had not yet established its hospital in that city, though authority had been obtained from the Japanese Government to open it. Two eminent German surgeons and a nurse from the German

Red Cross arrived in Tokyo in February, 1905, and immediately located their hospital, which was made a branch of the Tokyo reserve hospital, in the residence of Mr. Alexander Mosle, a German subject, at Sendagaya. This is a beautiful place on an elevated site in the outskirts of Tokyo. Two opportunities to visit the hospital were afforded on my return to Japan in September, 1905. The German surgeons brought a Decker hut with them, which was erected for an operating room. This they furnished, with a good outfit of instruments, which also came from Germany. Among their other surgical equipment they had a fine X-ray machine. Mr. Mosle's house was used for patients, as were also two wards, of the usual temporary type, which the Japanese had erected. The total accommodation of the hospital was from 75 to 100 patients. Except for the German surgeons and the nurse, Japanese supplied the personnel. Most of the cases treated were surgical, and they were usually old injuries for which the best surgical attention was demanded. This was afforded them by the German surgeons, who were extremely competent men.

The other two places where patients were treated in hospitals at Tokyo were Setakaya and Fukuromura. The former had 68 patients and the latter 11. This made a total of 11,218 patients under treatment in the reserve hospitals at Tokyo at the time of my visit in January, 1905.

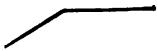
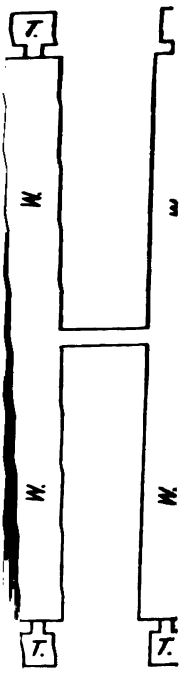
CONVALESCENT CAMP AT ATAMI.

The Atami camp is a branch of the Tokyo reserve hospital. Atami itself is one of the most delightful places in Japan, its winter climate being especially fine, much warmer than that of Tokyo or any other place visited in Japan. The town is backed up by high hills so that sunset is early and there is a large variation between day and night temperature, but notwithstanding this, at the time of my visit in January, the plum blossoms were out full. Atami has the further advantage of numerous hot springs which are available for all of the convalescent patients. The trip from Tokyo is rather a long one, about 9 hours. One first takes the railway train for 2½ hours to Kodsu, then a trolley to Odawara, and after that a curious railroad along the coast on which small cars are pushed by hand. Patients must find the journey

rather a tiresome one, though of course none but convalescents are sent here. Both officers and men are treated at Atami, most of the former staying at the hotel and the latter at the various houses in town. All are boarded at Government expense. One or more noncommissioned officers are put in each house to maintain discipline. These boarding houses are those patronized by a good class of Japanese and are excellent habitations, many of them being on the seashore and others in the town, further from the beach; they number 32 in all. Several have pretty gardens, and six little fish ponds are available in which the men angle for small goldfish with tiny rods. Their other amusements consist in visiting the plum orchards, tea houses, and various shops in town. The statement was made that there were no infractions of discipline, and limits were only established so that men might be called together if required.

From September 11, 1904, the date that the camp was opened, to January 16, 1905, about 4,000 patients had been received. Two thousand of them had been returned to duty, 1,000 sent back to the hospitals in Tokyo or given furloughs, 100 sent home discharged for disability, and 900 were present. It was only possible to examine a few cases. These were probably the worst; certainly they were not cases that should have been sent to convalescent camps, as they needed surgical attention not procurable there. One was a shell wound of the shoulder involving the joint, evidently with dead bone, and another was a suppurating wound of the foot. Few patients stayed less than three weeks at this camp, but the average length of stay was not more than four. No hospital is maintained, only a dispensary near which, in one of the boarding houses, men taken sick with acute illness are located. They have had no serious acute cases since the camp was opened. While the men are boarded in the houses and receive food from their kitchens, this is regulated by the medical officers to some extent, and an effort is made to supply them liberally. For this purpose, too, the camp maintains a chicken farm with about 2,000 fowls, from which 400 eggs are obtained daily. The personnel of the hospital consists of 6 medical officers, the surgeon in command having the rank of lieutenant-colonel, 9 chief nurses,

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and 48 nurses. As convalescents are guests at the boarding houses, they really have a much larger number of people caring for them. One Red Cross attendant is also stationed at Atami, and an intendance officer makes visits every ten days. If supplies are required between times, they are purchased by the chief medical officer, and a note is given which is taken up by the intendance officer on his arrival. The guard consists of a second lieutenant of the gendarmerie and 6 men.

HIROSHIMA.

This, as is well known, was one of the principal places for the treatment of sick and wounded. All patients, except those of two divisions who landed at Moji, and a few others came to Hiroshima first on their return from the front to Japan, so that it was necessary to maintain larger hospitals here than elsewhere, and the place was much more interesting to visit than the other division headquarters, as more recent cases could be seen here, as well as older ones.

PRINCIPAL HOSPITAL, HIROSHIMA.

Date of inspection, January 20, 1905. During my two weeks' stay in Hiroshima this hospital was visited almost daily and it was also inspected again a number of times on my return from Manchuria in September, 1905. Class of hospital: Principal reserve hospital of the Fifth Division. Class of cases treated: All serious surgical. Whence patients come: From the front or from the Fifth Division, the headquarters of which is in Hiroshima; in addition, patients come not infrequently from troops passing through Hiroshima on their way to the front. Branches: Seven hospitals and three convalescent camps. Location: In the town of Hiroshima, not far from the division barracks. Hiroshima itself is a miserably dirty place, one of the most unattractive towns in Japan. Capacity, 300; present number of patients, 190.

Personnel.—The personnel of this hospital is very large, as the administrative work is enormous. The lieutenant-colonel commanding the hospital has four assistants, medical officers, and besides, one surgeon for each 50 patients for whom accommodation is provided, there are in addition six officers who do only surgical work.

The conscript personnel.—On a par in numbers with the commissioned.

Sections.—This hospital has the usual four sections of the regulations, but it is so crowded together and irregularly built that it is almost impossible to make them out. No contagious cases are taken here.

Administration building.—This building is two stories, tile roof, plastered outside walls. It is a large building and is entirely occupied by offices.

Wards.—Two types are found here. The permanent are tile-roof buildings with walls plastered outside, which rest on stone foundations about 3 feet above ground; passageways are roofed but not inclosed, which is believed to be preferable, as the wards get more sunlight. The new wards are the usual barrack type, but are placed on large stones, thus leaving ventilation space underneath; they are not elevated more than $2\frac{1}{2}$ feet above the ground, and are necessarily close together on account of limited space. Only a few of the latter wards are found at this hospital.

Operating room.—This is in a separate building and is the permanent one of the hospital. This building contains an operating room and a dressing room with some smaller rooms for washing, sterilization of instruments, dressings, etc. Steam is supplied and sterilized water is available from the taps. The construction of the building corresponds with that of the main building, but it has one story; the floor is the usual stone flagging; the operating furniture is like that already described for Tokyo, but as more work is done here the supply of instruments is much more liberal. An excellent X-ray machine here has a separate engine for its dynamo.

Sterilization and preparation of dressings.—There is a large sterilizer here. All dressings are washed, re-sterilized, and re-used. This applies to the absorbent cotton; I did not see any of it in use, however. The dressings are first sterilized in a big sterilizer for bedding, clothing, etc., and afterwards in the sterilizer in the operating room.

Kitchen and preparation of food.—Kitchen was rather the best seen; besides the usual kettles for boiling, some fish were being nicely broiled over an open fire. The director also

showed me some well cooked potatoes and broiled chops which were intended for some of the officers, and some rice, fish, and bean cake for the men.

Storerooms.—The storerooms here are important, as they not only have many branches to supply, but are also required to provide for hospital ships and some supplies for trains. Only one month's supplies are kept on hand. Some articles are received from Tokyo, but the majority are purchased locally. Great ingenuity has been shown in the manufacture of various articles, for which bamboo is largely used. A litter is especially good, and costs but 70 sen; the poles are bamboo, with an extra strip of the same material to stiffen them, being really better than the ordinary litter with bamboo poles, whose chief fault is its springiness. The bed is a wide mesh of bamboo strips, and the legs are a bamboo loop with a block of wood between. Good bed cradles are made of the same material, as are also supports for bags used for continuous irrigation. Fairly good bedpans have also been made here of zinc. Numbers of regulation field articles were also exhibited.

Sterilizer for bedding and clothing.—There is a large and excellent sterilizer here, not at all like the one described in Tokyo.

Police.—Excellent.

Methods of transportation of patients to hospital.—By litters, rickshaws, and some mild cases by wagons.

Methods by which patients are transported in hospital.—On litters; the distances are very short, and the civilian employees, who are nearly all old men, carry the sick and wounded without much difficulty, although they are awkward.

Where patients are sent from hospital.—Some are returned to duty, but the majority go to their own divisions.

Remarks.—Since the fall of Port Arthur the number of cases in Hiroshima has much diminished, as but few new patients have been received, and the old ones have been largely evacuated to their divisions. A great deal of surgical work was seen at this hospital, but this will be described under the head of surgery.

HOSPITAL No. 5, HIROSHIMA.

Date of inspection, January 20, 1905. Class of hospital, branch of Hiroshima. Class of cases treated, only medical. Branches, is itself a branch. Capacity, 1,500; present number of patients, 900 odd.

Personnel.—Thirteen medical officers, 2 doctors, Red Cross. 6 apothecary officers, 1 Red Cross apothecary, 41 women nurses, 2,517 men nurses, 22 Red Cross men nurses. The men nurses are all military employees. The number of men nurses was so extraordinary that several times inquiry was made if it was correct, but I was assured that the figures were right.

Administration building.—This hospital was wholly a temporary construction, and this building is like the usual temporary ward.

Wards.—Entirely wooden pavilions, which rest directly on the ground, without underneath ventilation; they are low and are separated about 45 feet. The various wards have the covered passageways and but two rooms in the center instead of the four of the Tokyo hospitals. There is one ward for officers, the first seen, but severe cases are in wards divided into rooms by wooden partitions with the usual sliding paper doors of the ordinary Japanese house. The wards are large, accommodating 56 patients instead of 24, as at the principal hospital.

The director of the hospital is a lieutenant-colonel in the reserve. He stated that there were 10 Red Cross parties in Hiroshima. The hospital is not well located, but is extremely well kept. An opportunity was given to visit the insane ward here; it is an ordinary ward building, divided into barred cells or rooms; these are veritable padded cells; but 5 patients were under treatment here. One of the most interesting cases in the hospital is that of the purser of the *Heisan Maru*, who was taken prisoner at Port Arthur last March. He has a severe case of scurvy, with minute hemorrhages in the skin of his chest and face, and bleeding gums. He is unable to walk through weakness. He states that the Japanese prisoners first received vegetables, fresh meat, and bread, but latterly they have had little except rice and an

occasional piece of salt meat. Out of the 50 Japanese confined in Port Arthur, 16 or 18 had scurvy. The purser says that they were treated very badly at first, but after some Japanese successes there was considerable change in the behavior of their captors. Of the 6,000 odd patients at Hiroshima at this time, the hospital director here stated that 210 were typhoid and 200 dysentery. The Red Cross nurses at this hospital, as well as at the principal hospital, do day and night duty.

HOSPITAL No. 7, HIROSHIMA.

Date of inspection, January 21, 1905. Class of hospital, Hiroshima branch. Class of cases treated, only surgical. Branches, is itself a branch. Capacity, 2,000; present number of patients, 900.

Administration building.—Like temporary wards, divided into offices.

Wards.—The wards are simply set on large stones, as are the posts of the passageways. This affords some subfloor ventilation in the wards. This hospital is located on a sandy bottom, as is No. 5.

Operating room.—As described, and in addition a ward is devoted to the dressing of cases, during my visit a great many such cases were being cared for. A large number of women nurses, waiting assignment to a hospital ship, were on duty in this ward and made most of the dressings.

Canteen.—Yes.

Police.—Very good. The sand between the different buildings has all been raked and brushed and is extremely neat in appearance.

Methods of transportation of patients to hospital.—Rickshaws, litters, and wagons. When possible they are brought up by river to a point near it. When at the hospital wounded were being received, being transported from Ujina; it was a bad day, quite cold, with a heavy rain, and all the litters had frames, simply iron triangles to slip over the litter poles at each end, a cord being stretched between the upper angle of the triangles so that a waterproof sheet can be hung over the litter.

Remarks.—The many surgical cases seen here will be described under that head.

HOSPITAL No. 3, HIROSHIMA.

Date of inspection, January 22, 1905. Class of hospital, branch, Hiroshima. Class of cases treated, only beriberi. Branches, is itself a branch. Capacity, 500; present number of patients, 250.

Personnel.—The personnel of this hospital is 130 at present, but they would obtain more if it was full. There are six medical officers, one being detailed as executive officer, as is really the case in all the large hospitals, though the regulations do not provide for such a post.

Administration building.—Temporary ward divided into offices.

Wards.—All temporary wooden pavilion type.

This hospital requires no particular description, as it corresponds so closely with those already spoken of in detail in Hiroshima. The police was beautiful here. Sand had been brought from the river to cover the entire surface of the hospital grounds and then had been swept so it was spotless. Red Cross nurses are employed in the worst wards; these are divided into small rooms in the usual way. The surgeon in charge, a major, spent three years in Germany, and is evidently an especially well-qualified man. The various offices were visited, and the records were, as usual, excellent. A great number of cases of beriberi were examined here; they comprehend all classes—the wet, the dry, and the mixed. The surgeon in charge stated that 80 per cent of all diseases in the Japanese army were due to beriberi, notwithstanding the fact that it was practically absent from the army in peace. The treatment of beriberi in this hospital was purely symptomatic. Where the action of the heart was weak digitalis was used; dietetics were prescribed in the wet form, strychnine and the battery in paralysis.

HOSPITAL No. 6, HIROSHIMA.

Date of inspection, January 26, 1905. Class of hospital, branch, Hiroshima. Class of cases treated, medical only. Branches, is itself a branch. Capacity, 4,000. This is the largest hospital in Hiroshima. Present number of patients, 700.

Administration building.—Temporary ward type divided into offices.

Wards.—Temporary wooden.

Police.—Excellent. Here everything was examined carefully, commodes, bedpans, and all were as clean as possible.

Remarks.—A good plan of this hospital is inclosed. A number of frostbites were being dressed in a ward at the time of my visit. It is not intended that surgical cases be taken here, as stated above. None of these were severe, and only came because they were suffering from some illness. The surgeon stated that these cases suffered intensely at night from pain at the line of demarcation. The rooms for the recreation of patients are especially pleasant here. They have the usual games, newspapers, flowers, plants, benches, and mats, all of which have been presented. The buildings are identical with the last hospital described. In leaving a covered passageway between the wards one enters the hall, in which there are always cases with sliding doors for the shoes and at least two litters hanging on the wall; then at the side one enters a small open room the full width of the ward, and then nearer the ward is a passageway with a room on each side for the surgeon and nurse, respectively. The baths are excellent here, receiving steam from the boiler, as do the kitchens. The noon meal was a stew of meat and vegetables and rice; it was being eaten by patients able to get up in the small room off of the central hall.

The receiving and forwarding division of this hospital is a big affair, occupying a whole ward with its clerical force; this division makes its own records, separate from the hospital records. A squad of 30 men is also constantly on duty day and night awaiting call to a hospital ship. This hospital has 165 coolies who bring patients from the ships. When a ship arrives the principal hospital is notified by telephone and assigns a certain number of patients to each hospital, notifying each by telephone to send their receiving parties and at the same time informing them what transportation will be required. The proper coolies are then, and if there are not enough they have an arrangement with a merchant by which they can obtain 1,000 rickshaws and a number of little wagons. They are using for the transportation of patients, as far as possible, a little cart on rickshaw wheels, in which the patient can assume a semiprone position. These require but one man, while the litter at Hiroshima needs three bearers. In the kitchen a medical officer is on duty con-

stantly, inspecting the preparation of the food. The canteens here are run for the benefit of orphans at some institution; they took in 120 yen yesterday.

There is an entrance to this hospital where a landing platform is moored with an inclined way leading to the river; boats come directly from the ships here, and it is said that 1,500 men had been landed in three hours. Their precautions for the prevention of fire are the same here as at the other hospitals, which may be seen in the regulations, but were brought more to my attention as they had a very small blaze, caused by something hard striking a box of Chinese matches in a man's pocket in his clothing in the storeroom; fortunately, this was immediately discovered by one of the firemen, who continuously patrol the hospital, and it was put out. On the roof of each ward there are three small tanks, which are kept filled with water, and a number of fire extinguishers in each central passageway; just outside the fence are fire plugs. In the receiving and forwarding section signs are posted on the wall, with the names of the various wards, so that patients brought in by the carrying parties may be placed under the sign of the ward to which they are to go, and the parties from the wards may take them without confusion. Almost no patients here belong to the Fifth Division, and there is much clothing in the storehouse. Men, when transferred sick, wear their hospital clothing, and uniforms are sent to the division headquarters to which they belong. In order to separate the clothes each division has a bin.

HOSPITAL No. 1, HIROSHIMA.

Date of inspection, January 23, 1905.

This hospital has seen three periods of construction—Japanese-Chinese, north China, and this war. It is the permanent hospital for the Fifth Division, and is of the usual pavilion type. The old wards are plastered outside and finished in wood inside. This is the first hospital I inspected that has no wooden or plastered ceilings. This makes it rather rough in appearance, as the bare rafters show. The first wards partially inclose a court, so that extensions have been made by putting two rows of wards outside them. The passage, of course, runs on the near side in each case, but

the closets are close to the next row of wards outside, which is objectionable. This is the hospital for eye, ear, nose, and throat cases; also for many severely wounded, and for venereal cases of the Hiroshima garrison, which at present are only 40 in number. The operating room here is a large one, much like that of the principal hospital, except that it has no steam plant. There is a wealth of interesting surgical material, including many amputations. This is a 1,500 bed hospital. At present it has about 800 cases.

HOSPITAL NO. 2. HIROSHIMA.

Date of inspection, January 25, 1905.

This is the usual type of the new pavilion hospital. It is, however, badly situated on an old moat. There are twelve wards; capacity of each, 50. A passageway runs along the sides, and they go back one after the other. The kitchen is near the front ward, at right angles to it, and there are three closets within 40 feet of it. A small room at the rear end of the passageway is used for making dressings, but there is no operating room. This hospital takes cases for discharge for disability, those to be sent home on furlough, and those for convalescent camps. It has a capacity for 600 patients, and it has at present about 240.

Table of personnel for Hospitals Nos. 1, 2, 6, and 7, Hiroshima.

Personnel.	No. 1.	No. 2.	No. 6.	No. 7.
Surgeons.....	29	10	16	10
Apothecaries.....			4	1
Surgeons on probation.....			9	11
Red Cross doctors.....			5	4
Red Cross apothecaries.....			1	2
Apothecaries on probation.....			2	5
Chief nurses.....	54	11	8	7
Clerks.....			13	8
Red Cross clerks.....			1	2
Chief women nurses.....			3	
Chief nurses employed.....			75	51
Nurses.....	246	123	528	326
Nurses employed.....			20	
Women nurses.....	40		40	42
Instrument repairers.....	3			3
Cooks.....	31		62	41
Maids.....			38	32
Boys.....	20	29	28	22
Porters.....			165	5
Coolies.....			14	11
Temporary coolies.....				15
Firemen.....			9	8
Waiters.....			2	
Employees.....		16	2	
Temporary employees.....	36	1	3	
Total.....	459	190	1,048	606

BRANCH HOSPITAL No. 4, HIROSHIMA.

Date of first inspection, January 24, 1905.

This is the contagious-disease hospital and for that reason was particularly interesting. Its construction differs in no respect from other temporary hospitals and will not be described. It is located on the river and has a river entrance by which patients can be brought to it directly from ships. It is intended that all infectious cases that arrive or occur in Hiroshima should be brought here, and this has been pretty well accomplished, though there are a few cases, chiefly tuberculosis, in other hospitals. All contagious diseases from the front come here except those from the two divisions which are taken care of near Moji and a very few others. The hospital was opened in the last part of July, and its records, though incomplete, give a close approximation of diseases of an infectious nature brought from the field. The report of this hospital, made in September, is quite complete and will be found in the appendix on sanitation. At the time of my first visit here in January the director stated that since the date of opening in July, 3,491 cases had been received, of whom 450 died. Of these cases about 1,000 were typhoid, with 15 per cent of deaths, and 200 of dysentery, with 10 per cent of deaths. Both specific and amœbic dysentery had been encountered. Smallpox has afforded but 3 cases, one in a man who had been successfully vaccinated eight years ago, and the other two in men who were vaccinated last September, but unsuccessfully. All these cases were seen in the hospital. They were apparently doing well and should recover. Of the 29 words 18 are now open, September, 1905; these contain 129 cases of dysentery, 124 of typhoid, 46 of tuberculosis, 3 of smallpox, 9 of tetanus, 8 of leprosy, 18 of erysipelas, and 132 convalescents from various contagious diseases. This is their classification, and there is no way of finding what the original disease was. The cases of tetanus were all traumatic.

In September, 1905, the personnel of this hospital was, army surgeons, 16; Red Cross surgeons, 4; army apothecaries, 6; Red Cross apothecaries, 2; chief nurses, 5; chief nurses employed, 30; nurses, 250; Red Cross nurses, 2; chief women nurses, 4; women nurses, 40; coolies, 12; cooks, 25;

boys, 17; guard, 1; total, 414. Convalescent cases are practically the only ones that are treated in wards, all the others being separated into rooms such as already described. Two wards are taken for each disease—that is, the section of the two opposite wards. The laboratory is the best seen in an army hospital; it is a large room with facilities for making cultures, etc., in which much work is going on. Adjoining are two small rooms in which inoculated and uninoculated animals are kept. At the entrance of each ward is a fiber mat soaked with a solution of carbolic acid on which the feet are wiped. Dishes are brought from the kitchen and in front of the latter is a large kettle with a brick furnace in which all are boiled before being returned to the kitchen. There is also a bath house in which employed nurses are compelled to bathe before going home; they are required to wear white gowns over their ordinary clothing within the wards. There are two small bricked-up crematories in which refuse dressings and some stools are burned. They lack a steam sterilizer, sending their clothing to the city plant which is near them. All articles are loaded in a small open boat without covering of any kind. Closets are the usual type; a glazed earthenware pot about 2 feet deep is sunk in the ground underneath the hole in the seat; the pots are not large enough, however, and feces occasionally lodge on the surrounding earth. Lime is freely used both in the receptacle and around it and is scattered in the rear where the farmer ladles out the contents with a large wooden dipper which, between his visits, remains in one of the pots. The value of this mixture to the field should be inversely proportionate to the quantity of lime used, but they told me that it is allowed to settle and the liquid portion then has value. An attempt is made to burn feces in typhoid cases, and this is done pretty thoroughly. They have had 5 deaths from diseases contracted by the staff in the hospital, and meet with some difficulty in securing employees. Closets have a ventilating pipe which runs beneath the seat and is carried nearly to the height of the peak of the roof behind. More care might be taken in disinfecting the urine troughs. The typhoid had come mainly from the troops in front of Port Arthur, as have also some of the dysentery, but the Shaho has given a good proportion of the latter cases.

The two medical inspectors on duty at Hiroshima were given office room at one of the branch hospitals. Statistics received at this place from the beginning of the war till January 1, 1905, gave the total number of sick and wounded treated as 89,331; of these 36,681, or 41 per cent, were wounded.

In addition to the reserve hospitals at Hiroshima a receiving hospital is operated at Ujina under the hospital director. This hospital, or rather receiving station, is located on the dock between the landing place for the hospital ships and the railroad; it consists of ten buildings which were put up in September, evidently as the result of the experience of the war. It is beautifully clean, with a small office and dispensary in front and 8 wards in which about 1,000 patients can be taken. There is also a room in the front building where dressings can be changed, and behind, separated by a fence, is a small ward for infectious diseases, but it has never been used. The buildings are of the usual type so often described. Beds are not furnished, but shelves run along on each side of the wards on which straw mattresses are placed with the usual bed clothing. A kitchen is also provided. It is intended that wounded be sheltered here only while trains are being prepared for them. Slight cases are transferred by train to the hospital of the division to which they belong; all serious cases are sent to Hiroshima immediately. Separate books for each place of transfer are kept, in which are recorded the man's name, his rank, etc., and his wound or illness, from the time of his arrival to his departure. One of the surgeons visits each hospital ship arriving and separates slight cases to be sent away and those to be sent to Hiroshima, and notifies the latter place so that they may send their receiving parties. There are 5 surgeons, with a major at the head, here, and about 50 assistants; these do not include the bearers. Inclined planes lead from the loading platform of the quay to a couple of small boats moored at the dock at which the sampans land the wounded brought to the shore. Sampans of large size are used for bringing sick and wounded from boats; each takes 50 slightly wounded.

A number of the Hiroshima hospitals were reinspected on my return to Japan in September, 1905. They contained comparatively few patients then, and No. 2 had been closed. Most of my time at my later visit was spent in the contagious disease hospital.

HOSPITAL FOR PRISONERS OF WAR AT MATSUYAMA, JANUARY 25, 1905.

At 8 o'clock on the morning of this day left Ujina for Matsuyama, which, at this time, was the island to which all Russian sick and wounded were taken. It was about a 4½-hour trip by boat to the landing place at Tokohama and then one hour more by train to Matsuyama. The prison hospital camp lies between that town and Kosachi, which is on the railroad three or four miles nearer the landing place. The camp itself is about a mile back from the railroad, near the mountains. The day of my visit was cold, with a piercing north wind, which was severely felt at the camp. The buildings differ a little in their general plan from those described at the other hospitals. They have plastered walls outside and thatched roofs and the floors are not elevated more than a foot and a half above the ground, nor are they ceiled. They were not very warm, although about the same as the other hospitals in Japan. Some of the Russian patients who had been there a long time had put up ceilings of mats. The wards are heated by three little charcoal stoves each, and some of the officers have, in addition, hibashis in their compartments. While sick and wounded officers share a common ward, this is divided by mats into small rooms, which are curtained off from the central passageway. All the officer patients have the ordinary wooden bunks. Their ward was the first dirty one seen in Japan; they had thrown orange peels, cigarettes, and everything else which they wished to dispose of on the floor. The men have similar wards, and the worst cases have bunks, the others lying on straw bed sacks on the floor. Plenty of hospital clothing and bedding is provided. The water supply is ample, and there is running water in ditches through the grounds, though the water for drinking purposes is mainly obtained from a well near the kitchen. The closets are of the usual

Japanese type, and bathing facilities are provided by the ordinary Japanese baths with hot water. Besides the patients, 78 officers with their orderlies had been brought from Port Arthur the day before and more were expected. Forty-four officers and 1,128 enlisted men were present as patients; a number of these were suffering from scurvy and 3 from typhoid fever; the latter were isolated in a separate ward located at a little distance from the other wards. This had been built for the special purpose. The patients and the prisoners were rather crowded in the wards, not more than a foot separating some of the beds. The prisoner officers had straw mattresses on the floor. Medical supplies were of the same character as those at other Japanese hospitals, but were more ample in quantity than at any except principal hospitals. They have had to make longer crutches for the Russians, as the Japanese ones are so short they can not use them.

The medical personnel could not be ascertained, but it is evidently ample, and a Red Cross party is on duty with women nurses. The operating room is the usual separate building, but is well arranged and furnished. Both the chief surgeon and the senior Red Cross surgeon were especially well qualified men. They have the usual exhibit of foreign bodies extracted from wounds. One of these was the end of a Japanese shell, which was $2\frac{1}{2}$ inches across and about an inch through. It weighed nearly half a pound; it had passed between a man's ribs into his left pleural cavity, in which it had fallen down, to be later extracted with the ultimate recovery of the patient. The kitchen does not vary from those described. Japanese cooks were tried at first, but did not prove satisfactory, and Russian soldiers were doing their own cooking and that for their officers at the time of my visit. The evening meal was seen prepared; this consisted of roast beef, bread, and tea for the officers, who are also allowed to buy freely whatever is obtainable in the town, and bread and vegetable stew and tea for the men. A lieutenant is in command of the prison post, and a chief surgeon, a major, controls the hospital proper. The commanding officer told me he never had any complaints from the men, but the officers were not easy to satisfy. Those from Port Arthur had been deprived of their swords on arrival and felt this bitterly, saying it was not in accord with the conditions

of their surrender. Those from Port Arthur looked in excellent physical condition; all seemed to have plenty of liquor and cigarettes.

Though an attempt has been made to give the personnel for as many of the home hospitals as possible, this has not been very satisfactory. It is difficult to induce the Japanese to include the total working force of their hospitals in any statement that they give out, as they employ civilians so freely—just as they need them—that they do not see the necessity for specifying other than the actual surgical and nursing personnel.

The allowance at reserve hospitals, which was also the allowance for Matsuyama, though some places at the latter were filled by Russian convalescents, was as follows: 1,000 bed hospital (a branch), 1 assistant hospital director, 2 or 3 assistants, 20 ward surgeons, a chemist, a bacteriologist, or surgeons depending on the character of cases treated in the hospital, 5 apothecary officers, 7 intendants noncommissioned officers, 20 chief nurses, 200 nurses, 12 cooks, 15 coolies, 5 or 6 women to wash boilers, etc. When Red Cross parties are used, women are substituted for the men nurses, but they are still compelled to retain the chief nurses. A Red Cross party now has 4 coolies. While this was the regulation allowance, in reality there was usually a larger personnel found on duty than this, as the regulation allowance was provided for the maximum number of patients who had been under treatment at any one time and then, as the number of patients diminished, was only gradually reduced.

The contagious disease hospitals at home always had a slightly larger personnel than the other hospitals. In September the contagious disease hospital at Hiroshima, which was supposed to be supplied with the personnel necessary to care for 600 patients, though not so many were actually present, had: 1 assistant director, 2 assistants, 15 surgeons, 1 chemist, 1 bacteriologist, 5 apothecary officers, 7 intendants noncommissioned officers, 12 cooks; 300 all told. Of 220 nurses, 160 were actually in care of patients, while 60 were doing other work. At this hospital it was intended that 1 surgeon, 1 chief nurse, and 8 nurses should care for 50 slight cases, and that 1 surgeon, 1 chief nurse, and 12 nurses should care for 35 serious cases.

LINE OF COMMUNICATION HOSPITALS.

DALNY.

Chinese bandits destroyed a good portion of the Russian town of Dalny in the two days between the departure of the Russians and the arrival of the Japanese. The Chinese city, on lower ground near the harbor, is practically intact. Dalny had a municipal water system installed in 1903, but in the winter of 1904-5 this was frozen, so that water was necessarily obtained from various wells in and near the town. This water is bad, and soldiers are not permitted to drink it without sterilization, which is performed at numerous boiling stations in the town. These were small temporary wooden structures with open fires in fireplaces with iron kettles; Chinese employed keep up the fires night and day.

In Dalny is found a principal hospital, with two branches. The former occupies the old Russian hospital on top of a hill in the new town. The wards are one-story brick structures on each side of an entrance way, a central hall, which has offices communicating with it. The wards are of a bad shape, the largest about 35 by 40 feet, so that, in order to use the floor space economically, it is necessary to arrange the beds irregularly. The Japanese have built platforms on the cement floors. These are about 1½ feet high, and Chinese straw mats are placed on them, on which the patients on their bed sacks lie directly. Russian stoves heat the wards well. Part of the hospital was burned, and a Russian dwelling house is used for the administration building. In the houses there are modern closets, but they can not be used on account of lack of water, and the Japanese have constructed their usual outhouses for latrines; some of these have boxes and others are merely pits in the ground. The same type of closets is in use throughout the town; at the hospital they are frequently dangerously close to the wards and kitchens. The Russian hospital kitchen was a small open lean-to, in which were brick furnaces with iron kettles for boiling the food. The Japanese have abandoned this and built an open kitchen, with a galvanized-iron roof, next to it. In this everything is cooked by boiling, Japanese

acting as cooks and Chinese as helpers. At the time of my inspection they were cutting up some meat obtained locally, which was very stringy and tough, and were boiling this and some cabbage. No milk except condensed milk was obtainable, and eggs were very scarce; none were seen in this hospital. Two wards were capable of containing 90 patients laid as close as possible on the floor, and in the next block two others had 75 patients each; the former had 10 and the latter 7 nurses. It was stated that the personnel had been depleted by sickness and transfer to Japan. Some of the patients had hospital clothing, while others were without it. The patients in this hospital were about to be transferred to a large warehouse three stories in height at the upper end of the Chinese city. This warehouse was occupied as a hospital for a time, but on my return in September the hospital had been reestablished in the old Russian wards.

At the time of my first visit it was stated that many of the patients were fit to go to Japan, and this appeared to be true. The hospital furniture was crude, urinals, bed-pans, etc., being improvised. On a bluff over the river two rooms in a small building are devoted to an operating room which looks as though it had been used for the same purpose by the Russians, but the statement was made that their operating room had been burned. The present one has good light and cement floors draining through the center; the operating room furniture is of the character already described in the base hospitals in Japan, but is limited in amount. Stoves are used for heating. The Japanese have built a shed connecting with the operating room in which patients are kept waiting their turn; a Japanese bath has been constructed in a wooden building, and a mortuary, a small Russian brick building, is now used to shelter the dead bodies of officers and soldiers.

The Russian church on the top of the same hill is used as an officers' ward; it is cut up into small rooms, is heated by steam, and answers its purpose well. Field officers are provided for separately in a space back of the altar; the body of the church, a small room, and several upstairs chambers are used for wards. There is a good steam sterilizer at this hospital and a contagious-disease ward. Three cases of

typhoid fever were under treatment there. The dispensary is also in a separate building; it contains the usual assortment of liquid drugs; apparently no food is prepared here. The hospital has a small furnace for burning infected articles; it is uncovered. The hospital has a number of covered rickshaws for carrying patients. One severe case of sepsis was seen isolated in a separate building. One of the branch hospitals is in the town, occupying Russian houses. This branch requires no particular description.

On February 10, 1905, the largest branch hospital, which is on a hill about 2 miles north of the bridge between the old and new cities of Dalny, was inspected. This hospital is located in some Russian barracks which were not entirely completed at the time the Japanese entered the town, and were also partially burned by the bandits. They are large stone buildings, and it was intended to put tile roofs on them, but the Japanese have roofed them with boards covered with galvanized iron and have placed a small oblong superstructure on each building, with a wooden frame and matting sides for ventilation. These barracks are of several types, but the majority at the middle of one side have a projecting entrance way about 12 feet long, on one side of which is a room used for nurses and for a small amount of stores; the patients' cups and dishes are kept in the hall way. The wards have four Russian stoves, one at each end and one near the middle of each side. The buildings are at ground level and have cement floors. The Japanese have put in platforms of wood, about $1\frac{1}{2}$ feet high, which cover the entire surface except a small entrance way. These wards take 140 patients, each side having two rows of 25 each and one of 20, the remaining space being occupied by a few blankets in a pile. The commanding officer said he had had 10 nurses to a ward, but on account of the demands of Port Arthur and the front, some have but 6 now. Those seen were all soldiers. That the personnel is inadequate is manifest from the appearance of the patients, many of whom still have dirty, blood-soaked bandages. There are some smaller buildings of the same type here, which hold about 30 patients each. A detached group of similar buildings, about 200 yards to the north, is used

for contagious diseases, and contains some 20 cases of typhoid. A Russian theater, 400 or 500 yards to the south, is also available for contagious diseases. It is empty at present. The surgeon in charge says that he has had 800 cases of contagious disease under treatment at one time, and has sometimes had 40 deaths per day, mostly from beriberi. He apparently includes beriberi among the contagious diseases. The capacity of the hospital is stated to be 2,800 beds, but it has frequently had many more than that number of patients. At present there are but 12 surgeons and 80 nurses on duty.

Japanese civilian employees are not available, but about 200 Chinese coolies are hired. They are useless, except as laborers, and so nurses are detailed by roster to superintend the cooking. The commanding officer of the hospital is evidently a competent and resourceful man, and he has done a great deal to make it as comfortable as possible. As the Dalny water supply is frozen, he has dug a well 80 feet deep, from which a fair amount of water is obtained. The closets, in wooden sheds, are not more than 15 paces from the ends of the wards. Wooden boxes receive the urine and feces. The operating room is in one of the smaller buildings, and is furnished like that in the principal hospital in Dalny. Some cases of frozen fingers were being operated on during my visit. The kitchen was destroyed by fire, but it has been replaced by a galvanized-iron structure, in which 17 large iron kettles are ranged on each side. One kettle prepares rice for 100 men. The mixed barley and rice are used, and on one side soft-boiled rice is prepared. There is an abundance of various foods in the kitchen—rice and barley, sides of beef, thin and poor, extract of sole, two kinds of canned salmon, desiccated potatoes, parsnips, lily root, condensed milk, and Armour's canned corned beef. Everything was apparently boiled. Bean soup appeared to be the favorite dish, but they had a few eggs for the worst cases. The patients were of all classes, about 1,400 in all; mild cases, those too serious to transport, and those about to go to Japan. Long rickshaws are available for transporting patients to and from the station; it is a long distance. The patients have in part been supplied with hospital clothing.

At the railroad station four or five closed sheds have been erected for the reception and dispatch of patients. These are at ground level and are cold and uncomfortable. There is also a small dispensary with a few drugs and stimulants. Chinese coolies are exclusively employed to carry patients to and from the station. They are not adept. All kinds of litters were in use, many having burlap beds and wooden crosspieces. Another common type has a shallow wooden frame with a burlap bed. The majority of the litters have slings, which are placed over one shoulder, but some of the shallow wooden boxes have slings which, instead of going over the shoulders of a bearer, go over a long pole, which rests on the shoulders of two bearers. One of the hospitals is very near the station, but the others are at some distance from it. No sheets are used to cover the litters.

The Dalny Hospital, operating two branches, had accommodations, in February, 1905, for about 10,000 men. By taking other buildings they had, however, been able to accommodate at least 20,000 at times, before the fall of Port Arthur. At the time of my visit there were about 5,000 patients. There is little of interest to add as the result of my second inspection of the Dalny hospitals on September 11, 1905. As stated, the principal hospital is again on the bluff in the new town. The branches are the same as noted above. A new operating room is in process of construction at the new hospital. They are still using the old room for operations, but have fitted up a separate dressing room in another building. This was the first separate dressing room seen in any Japanese hospital. The statement was made that at this time they had accommodations for 6,000 patients, but only had 2,800 under treatment. Of these 80 were typhoid. They are building a contagious disease ward on the plan of the Japanese wooden wards at home. Many of the typhoid cases had apparently contracted the disease in Japan. Beriberi, as usual, is very prevalent, but the hospital director thinks there are less cases than during the preceding year. The director states that he has 25 medical officers and assistants all told, and from 500 to 600 personnel, besides 7 parties of the Red Cross, of which 3 are at the principal hospital. He states further that he would be given

more personnel if he required them without any request, as the chief surgeon would send them from Liaoyang as soon as he saw by the hospital reports that they were needed. He states that patients are never sent directly from Tiehling, but go through the hospitals at Mukden and Liaoyang, and may even be stopped at Tashihchiao. Very few patients are now sent to Yingkou. While the Red Cross personnel has been increased in the Dalny hospitals, no women nurses were ever permitted there or elsewhere in Manchuria.

LIAOYANG.

Liaoyang was an important point for hospitals almost from the time the Japanese captured that city. The line of communication hospital was opened there on November 17, 1904. It consisted of a principal hospital and two branches, which were lodged in Russian buildings, along the line of the railway. The principal hospital was in the middle, and the distance between the two branches was about $2\frac{1}{2}$ miles. In case of need it was also possible to open two other branches, which, with the other hospitals, would receive 10,000 sick and wounded. For one of the last branches Chinese houses were utilized. In addition to the permanent structures at Liaoyang a few temporary sheds had been erected at the time of my visit there on February 16, 1905. On this date the hospitals in Liaoyang were not full and possessed no special interest, nor was it possible for me to devote more than a short time to them. These hospitals were, however, reported to have been very busy after the battle of Mukden, as almost all the wounded of the army passed through them. From the 14th to the 25th of March the daily number of patients arriving was between 4,500 and 5,000, in attendance upon whom 80 surgeons and 700 nurses, active, reserve, and Red Cross, were employed. All the wounded arriving at Liaoyang were inspected, and, if found in bad condition, were kept for some days in the hospital. Many operations were performed there at this time.

The following statistics were furnished by the hospital director: From the 17th of November, 1904, the date of the opening of the hospital, to the 31st of July, 1905, the number

of patients treated was as follows: Sick, 60,313; wounded, 52,421; total, 112,734. The greater part of the sick were suffering from beriberi, or from pneumonia or inflammation of the larynx. At least a quarter of the sick had beriberi. The majority of wounded came from the battle of Mukden. In addition 50 Russian sick and 3,258 wounded, a total of 3,308 patients, were admitted. The number of deaths was 1,744.

On February 17 accompanied the hospital director of the Liaoyang Hospital to Yentai, where he was going for a conference with the medical officers in the branch hospital there. Yentai at that time was the head of the railroad and was receiving patients from the whole front. At first the Japanese authorities did not permit buildings to be erected there, but recently a number of wooden wards, covered with roofing paper, have been built. These are necessarily very crude, and as warmth is the great requisite they have but few windows, which are all covered with oil paper, so that the interiors are very dark. The patients are elevated on platforms. Supplies, as well as food, are limited. An operating room of the same style as the other buildings has been constructed. Each ward takes nearly 50 patients, and the normal capacity of the hospital is 700, but 1,500 have necessarily been cared for at one time. The personnel consists of 12 officers, 1 intendance officer, and 151 nurses and employees. Patients are, of course, transshipped from here as promptly as possible.

MUKDEN.

On April 9, 1905, a line of communication hospital replaced the Second Field Hospital of the Fifth Division, which had been in Mukden since the Japanese entered that city, a month previous. On April 12 the personnel of the line of communication hospital consisted of 11 surgeons, a chief, with the rank of major, 2 apothecary officers, 1 intendance officer, with 3 noncommissioned assistants, and 170 nurses, including 35 chief nurses. Like the other line of communication hospitals, the number of personnel is regulated by the needs of the hospital. The personnel and supplies of this hospital came from Yentai, which is really now only a rest

station, with 1 surgeon and 15 nurses. The Mukden hospital consists of a principal part and three branches, but only one of these is now open, as there are so few patients. It was intended at this time that this hospital should provide for 1,000 sick and wounded who came from the different armies, those who were expected to recover soon to remain and the others to be sent to Liaoyang. On this date only 190 patients were under treatment, including 60 Russians, the greater part of whom could not stand transportation. There are a very few cases of typhoid and a number of beriberi. The principal hospital at Mukden was the old main hospital of the Russian Red Cross near the station. It was intended that the three branches should be: No. 2, in the Cossack barracks; near this, No. 1, the military hospital, and that of the Red Cross still nearer the station; and No. 3, the old Chinese hospital, just outside the wall at the east gate of the city. The barracks for these hospitals are of the usual type, which will be more fully described at Tiehling.

The hospital in the city is by far the best hospital in Mukden, and was one of those used by the Russian Red Cross. It is constructed of permanent buildings of brick, with very thick walls, and inclosed passageways in front of the wards. These are of the pavilion type. Beds are generally used, though not enough are on hand for the patients, of whom there were about 75 on April 25. The hospital will accommodate from 150 to 200, and there are some Chinese houses at the back which will take 250 more patients. These were occupied by one of the field hospitals of the Fourth Division at one time. The operating room, in a detached building, is excellent. All the water used for drinking purposes at the hospital is boiled. Large kettles, those used for boiling rice, were employed for this. The kitchen is of the usual Japanese type. Four surgeons, including the chief—a major—were on duty, 6 chief nurses and 46 nurses, a few of whom were civilians. In addition, a number of Chinese men and women were employed for coolie work in the kitchen and for repairing the mattresses; these numbered from 20 to 25. The cost for the subsistence of each patient is nearly a yen

a day; no limit is placed on this in time of war. Patients here are not severe cases, as it is desired to keep those at the station where it is more convenient to transfer them by train. At the time we entered Mukden the hospitals, which were still being administered by the Russians, were in a disgracefully dirty condition, but at the time we left there the Japanese had them well policed. It was stated that no patients had been sent to the rear by rail from Mukden or received there by rail until May 1. In August the four hospitals at Mukden were said to be capable of taking 4,000 patients, though, in reality, they only had personnel for about 2,000, and this number was never exceeded in practice.

TIEHLING.

May 10, Tiehling.—A line of communication hospital, belonging to the Fourth Army, was established here on May 6. It has the Russian barracks and some other brick buildings near it. Eleven buildings are occupied in all. Patients are taken from any troops at the front and are brought to it both by bearers and carts. The time that patients are retained depends on circumstances. As a rule, slight cases are retained until they recover and then are returned to duty, and serious cases are evacuated to the rear. However, when the buildings become too much crowded, the patients, no matter what is the nature of their illness, are sent to the rear immediately. Mukden is their usual destination. The number of patients changes daily; on June 5 it was 281. Reservists, both Yobi and Kobi, are on duty at the hospital, but no Red Cross personnel. A surgeon-major is in charge.

At the date of my departure from the front in September, 1905, Tiehling had become a most important hospital point, where the Japanese had employed a great many men and spent hundreds of dollars in providing adequate hospital accommodations, in preparation for a great battle on their front in the fall. At that time all the hospitals were visited. The principal hospital is now divided into two parts, a main and a contagious-disease section. The former has two main wards; the front one (the hospital in the month

of May) is about 120 yards long and 15 yards wide. It is a stone building with a wooden floor, on which nearly all the patients have beds. Its capacity is said to be about 360. The hospital is not very well located, as the ground is swampy, the general condition of Tiehling near the station. A good deal has been done, however, in filling, constructing ditches, and in making raised walks of brick or earth. The hospital still presents a busy scene, with many soldiers and coolies at work on the grounds and buildings. About 100 yards to the east of the ward above mentioned is another very large ward. Extensive repairs have been necessary here, for the Russians had not as yet completed the building, or it had been partially destroyed. This ward is of the same construction as the first one; it has no beds, but the Japanese have put in a wooden platform about $1\frac{1}{2}$ feet above the ground, and all patients have bed sacks. This great building, about 150 yards by 15, has not yet been divided longitudinally, except by ropes, on which short cotton cloths are stretched, making four sections. The two end sections have rooms for offices; these contain beds, and the row juts out into the room to the width of about a foot more than the length of the bed. The rooms are ceiled at the height of about 10 feet. The peak roof of the main building runs up to about 25 or 30 feet; it is not ceiled, but has numerous mansard windows. This ward has a capacity of about 540 patients. At its rear jut out the usual bath and closet addition seen at the Japanese hospitals. Besides the two large wards in this section are a number of other buildings and an office, which was probably used for the same purpose by the Russian troops, several Russian houses, and some mat sheds. Altogether there were about twenty buildings here.

Four hundred yards to the east, upon an elevated dirt road, is the contagious disease section. This is newly constructed, and all the buildings are mat sheds, except the laboratory, which is frame. There are eight buildings here, including three double wards, a sterilizing room, a laboratory, with a portable sterilizer in the middle, under a shed, with rooms on each side, one for nondisinfected articles, another for disinfected, a dispensary, etc. The wards are dark, as the win-

dows in the mat sheds are small and do not all open. A great deal of care seems to be taken in preventing infection by flies here. The ward construction is on a very simple plan—a central passageway, with a room on one side and wards on both sides. They lie, the one behind the other, about 15 yards apart. The closets are separate. The laboratory is excellent and is capable of doing any kind of bacteriological work. The capacity of the contagious-disease section is about 221. It has 80 patients at present; nearly all of these are typhoid.

The total capacity of this hospital is about 1,100. The director told me that his personnel was about 200. He said that there were 10 surgeons besides himself, 5 Red Cross surgeons, 3 apothecary officers, 1 intendants officer, with 2 non-commissioned officers. They certainly employ from 50 to 100 Chinese coolies here. They have done and are still doing filling on a large scale, earth being brought about a quarter of a mile on a portable railroad. About 300 soldiers and 500 coolies are now at this work. A board of officers determined the requirements of this hospital in reference to buildings, and the work is proceeding just as though there were no prospect of peace.

At a second visit opportunities were given to see more here. The smaller Cossack barrack ward in front has beds. All classes of cases, except contagious, are taken in this ward, but they are principally beriberi. It is divided into one small and three large wards. Mat sheds, extending in front of it, provide dry earth closets and hot water. These sheds are about 45 feet long, and the first section has a kettle for heating water, and the last the closets. There is also a mat-shed bathhouse built in the same way as the closets. The ward is well heated by Russian stoves. The kitchen is a mat-shed structure immediately at the south of this. On the south there are also some other sheds for the personnel, etc. The dispensary, a long stone building to the north of these wards, has a mat-shed addition, which is used for storing and for receiving and issuing supplies. The director's office is in a house immediately to the north of the larger ward. This is also occupied by offices, but is too small, and is to be replaced by another building 75 yards to the west. The receiving and forwarding department, northeast

of this, is a mat shed, which will be replaced by a permanent building. The same will be done with the post-office, which is now in a near-by tent. A little to the northeast of this another building will be erected for the shelter of patients arriving. These great changes are interesting, showing that, while a field hospital does little, a line of communication hospital a good deal without much expense, when a Liaotung garrison hospital is established it is made as good as circumstances allow.

Branch Hospital No. 1.—This is located in the Chinese city of Tiehling, in a Chinese compound of large extent. It is hardly necessary to discuss this hospital at length further than to say that it is well adapted for its purpose, for which it was also used by the Russians. As usual, the Japanese have put in platforms for the patients. Nearly all the wards have Russian stoves. All the rooms are ceiled and papered, and the police of both the yards and the wards could hardly be improved. The food seemed ample and of good quality; meat is provided twice daily; two or three green vegetables on hand; eggs are plentiful. This hospital is for light cases, and has but 30 patients at present. A number were transferred yesterday and this morning. Its capacity is 217, or 289 crowded. Its personnel consists of 1 surgeon, a major, 2 chief nurses, and 2 Red Cross parties. Most of the cases are beriberi; no wounds; 2 pneumonia.

Branch Hospital No. 2.—This is the contagious disease hospital of Tiehling. It is located in about a dozen Chinese houses, half a mile to the north of the station. It has an extreme capacity of about 200, and at present contains 141. The personnel consists of a major, 9 medical assistants, 3 apothecaries, 1 intendance noncommissioned officer, and a total personnel of 130, besides about 20 Chinese, employed as coolies. The chief is one of the most competent medical officers met. He states that, as the patients are not allowed to visit the closets, the enlisted personnel is necessarily large—larger than in an ordinary hospital. It was noticed that at least three-quarters of the privates were assistant nurses and the others were nurses. The cases are nearly all typhoid, with a few dysentery and 1 typhus; no smallpox. At first it was thought that some of the cases on admission were malaria,

but it has not been possible to find the plasmodium in a single instance. They have a relapsing fever case from Chingungpu and a beautiful specimen of blood. This hospital is wonderfully good, especially considering the poor quarters it has to occupy. It has no operating room proper, but a small room is set aside for dressings, with the folding operating table. The laboratory is well equipped with facilities for making cultures. A macroscopic Widal was shown me.

Patients when received are distributed into severe and slight cases of their particular class. If this is not possible, they are put in an observation ward till the diagnosis can be reached. Convalescents are also separated from other patients. The most minute care is taken to prevent infection, and the arrangements are excellent. All the buildings are carefully screened with mosquito netting, some of the doors having hanging screens of this material, with cross strips of wood at the bottom, which cause them to fall into place after being raised. No screens are used in the front doors, but all foods, dishes, and medicines are placed under covers with bamboo frames, ends and sides of mosquito netting, with top of cotton cloth. The dishes and utensils are boiled. Dry lime is freely used in the closets, which are movable boxes. This method is open to objection. It is much easier, however, to burn the dry product than if much water were used, and all excrement is collected and burned daily or oftener, straw and other inflammable material, saturated with petroleum, being used for this purpose. No crematory is available, so the burning is carried on at a selected place on the ground. All the bedding, clothing, etc., is disinfected in a portable single-skin sterilizer, which is under an open shed. Fly paper manufactured on the premises is freely used. The entrances of the hospital have the usual foot mat, saturated with carbolic acid. Food is apparently very good. Many eggs were being issued from the dispensary. The police of the hospital is excellent.

Branch Hospital No. 3.—This is a quarter of a mile north-east of the station, on extremely low ground. It was a Russian hospital, which had 2 large wards, 100 by 16 yards. The buildings are of stone and brick, with galvanized iron roofs. Only one of these wards, however, was actually used as a hospital by the Russians. This has the usual mansard window

roof and also Russian stoves. The other barrack has been roofed by the Japanese, who have built a peak roof for it. It has as yet no provision for heating. This building was apparently left uncompleted by the Russians. The Japanese have done an enormous amount of work on it; in addition to the roof, they have ceiled it inside with mats and plastered it with clay, also putting down a good floor, so that they have now an excellent building; they have also erected mat shed closets in the rear, dry earth. An immense amount of filling has been done here, as well as at the principal hospital. Among other improvements are a mat shed kitchen, which is finished inside with boards, next a layer of oil paper, and then mats, which will be plastered before the cold weather sets in. A bath house has been erected. The staff of this hospital consists of 1 chief surgeon, a major, and 2 Red Cross parties. There are no patients, but a number of sanitary soldiers, who have worked hard in making repairs, are resting in the hospital for a few days. This hospital will accommodate 600 patients. Its repairs have been much hurried in the expectation of a big battle in the fall. The personnel could not care for 600 patients, of course, but more would be obtained from the principal hospital if they were needed. The surgeon here was formerly in charge of all hospitals at Tiehling and says that in the last two months 10,200 patients passed through them. He states that 40 per cent of these cases were beriberi.

RUSSIAN HOSPITALS.

Port Arthur in February, 1905, was under Liaotung garrison. The chief surgeon, Colonel Kago, who was stationed at Dalny then, was in Port Arthur inspecting at the time of my visit. The authorities stated at that time that they still had 18,000 Russian patients under treatment in from 15 to 20 hospitals. The medical headquarters of the lines of communication was located in a large office in the Chinese city, a major-surgeon being in charge with 3 assistants and about 30 clerks, all from the medical department except the orderlies who came from the line. This office makes all arrangements in reference to disposal of Russian patients in the hospitals, the evacuation of hospitals, and the removal of the Russians to Japan.

The first hospital visited was one on a hill in the north-eastern part of the Chinese city. At that time this was the only hospital which had Russian patients and a Japanese staff, Japanese patients being also taken. It was used to receive Russians and to send them to Japan. The buildings were old stone barracks. Before the city fell they were used by the Russians as a hospital. They are ill adapted to the purpose, being about 40 feet wide and some 360 feet long. They have stoves in the diagonal corners, and patients rest on platforms, each of which takes 2 rows, head to head, in the central space and laterally. Outside these platforms one walks on a cement floor, raised about 1 foot above the ground level. Straw mattresses and blankets were available in sufficient quantities. There is no ventilation, and there is a wooden ceiling at the height of about 15 feet. The air was foul and had a strong smell of unclean humanity, and the cement floor was broken in places. Both army and Red Cross personnel are on duty here. The surgeons state that beriberi did not occur among the Russians, and that cases of typhoid and dysentery were rare. It should be mentioned that the Japanese destroyed the waterworks, and that water was obtained from wells located in various parts of the town; this practice continued at the time of my visit. The Japanese have examined the water and pronounce it good. The wells are exposed to surface contamination, and no particular pains are taken to prevent this. The Russians say that they boiled this water as the Japanese are doing now. Scurvy was the prevalent disease among the Russians at this hospital and some very severe cases were seen. The normal ration consisted of a can of meat per day, but this was reduced to one-half a can per man twice per week; plenty of bread was available and a compressed cabbage, so the scurvy was due apparently to a nitrogenous starvation. The closets for these hospital barracks are located about 10 paces in the rear and have wooden receptacles, which are foul. The town itself is filthy; there are heaps of organic matter and rubbish near each house, from which they were thrown, and though the Japanese are cleaning up in places, they do not appear to regard these deposits as particularly dangerous. It was impressed on me at the chief surgeon's office that the Japanese

had taken the available buildings for their hospitals on their entrance, so that they should not be compared with the Russian hospitals, which were naturally much better adapted for the purpose, but that the Japanese got better results notwithstanding. The Japanese dispensary at this hospital had few drugs displayed, but information was received that they had plenty in store. Their treatment of beriberi consisted of sulphate of magnesium and strophanthus, and of scurvy was almost entirely dietetic—oranges, eggs, condensed milk, brandy, and Japanese wine and beer; they also gave quinine and iron.

On February 13 the Japanese director of the principal hospital showed me some interesting photographs, which he had taken at the field hospital in front of Port Arthur. Most of them were of frightfully mutilating wounds produced by shells and hand grenades; others were amputations, all circular, and still others of the field hospitals themselves. His specimens of missiles did not differ from the usual exhibition, except that he had the end of a 4.7 shell, which had been removed from a man's thigh; this was very large and must have weighed about 5 pounds. The surgeon stated that Russian bullets were usually deformed by striking bone, and he showed numerous specimens of this. I then visited the permanent military hospital of the Russians in the Chinese city. This consisted of large stone pavilion wards, on the hill opposite that visited yesterday. The pavilions were about 100 feet apart and rise, one above the other, on tiers; they take about 100 patients and are heated by Russian stoves at the diagonal corners; they have cement floors, about 2 feet above the ground level; window space is deficient. The wards have wooden ceilings at a height of about 12 feet; there is no ventilation and the odor is bad. The operating room is excellent, tile floor, good illumination, with a large window. Supplies are not excessive in amount though good in quality. Asepsis is imperfect. The officers' wards have a lateral corridor on one side into which the rooms open. The latter are comfortable and not crowded; ventilation is sufficient. There is an X-ray apparatus here, though no pictures were seen, and, from the appearance of the room, doubt if it was in working order. The police inside the wards was bad, and no hospital clothing

being provided, the men, lying in their uniforms, looked very untidy. They had plenty of bed clothing. The wards, as in the Russian hospitals generally, are too wide, allowing double rows of bunks on each side. The Russians run this hospital absolutely, except that a Japanese medical officer acts as inspector. The kitchen, which was in charge of a woman nurse, was excellent; the soup, rice, and officers' food were well cooked, and the woman in charge seemed to have no difficulty in enforcing her orders to the numerous helpers who were convalescent soldiers. It was impossible to determine the personnel of this hospital, but not more than 10 Russian surgeons, about the same number of women nurses, and perhaps 100 convalescent patients were on duty here. The patients, about 1,800 in number, were pretty evenly divided between scurvy and wounded. Next the Red Cross permanent hospital was visited. This is also in the Chinese city, situated on a hill almost opposite the military hospital. It is a large two-story building, with extensive bomb-proofs dug in the side of the hill near it. In peace times but 60 patients were accommodated here; during the siege they had at times, using all the space, about 300. The operating room on the second floor is good; large window, tile floor, 2 tile stoves, and hard finished walls; green silesia curtains are at the windows. At this hospital they have a dressing room, as well as an operating room, which, of course, should be the arrangement in every hospital. Both the last two hospitals had electric light, but the plant had been destroyed. A Russian colonel is in command of the military hospital and a Red Cross director of this one.

The Red Cross director, General Balachof, is a very busy man, as he has numerous interests in reference to the general administration of the Red Cross and the administration of the hospital suffers. The chief woman nurse is apparently extremely competent, and the running of the hospital seemed to depend mainly upon her. So many volunteer nurses have worked in the Russian hospitals that the position of the nurses is a curious one; in many instances they really have more power than the surgeons, and do not care to take directions from them. They almost always live at the same table with the surgeons, and are on quite familiar terms with them.

The Red Cross administration building near by was next inspected. This contained the quarters of the delegate and the assistant delegate, a large workshop, a number of small two-wheeled ambulances, drawn by horses, of which several still remain, and about half a dozen cows. The authorities stated that they had just received 1,050 packages of medical supplies and comforts, and their storerooms were large with a fair stock. The building had been hit a number of times by shells, and the assistant delegate showed me about a peck of rifle bullets he had picked up in the small yard.

The Russians took most of the good buildings of large size for hospitals before the town fell. Some of these were so injured by shell fire that they had to be abandoned afterwards. (The Russians say that 3,000 of their wounded were killed by Japanese fire during the siege; probably this is a gross exaggeration.) At all events, the number of buildings available for hospitals when the Japanese took the town gave them only a few to choose from for their own hospitals. They, of course, had to have large buildings and so took barracks. These have been described and, as stated, are far from ideal structures for hospital purposes. Most of the Russians left the city when it was captured. This left all the Russian hospitals in Port Arthur, on its fall, very deficient in personnel, and at this time the Japanese were strained to their utmost to provide sufficient personnel for themselves; so this threw a burden on them, which they could only sustain by taking medical officers and men from other places in Manchuria, and Dalny especially had been reduced to the absolute minimum. They could also piece out a little, perhaps, by leaving Russian convalescents as nurses, but they could hardly do this extensively, because they had no large number of troops to spare for Port Arthur, and such convalescents were much easier supplied in Japan. At the time of my visit they were, in reality, giving the Russian sick and wounded the same care as their own, and more could not be expected.

Next Reserve Hospital No. 10, on the seashore in the new town was visited. This was intended for the new hotel. It is a fine stone structure and patients are very comfortable in it. It is under Russian auspices, but is fairly clean.

The rooms are, perhaps, slightly overcrowded and the ventilation is villainous. Beds are furnished. As in all the Russian hospitals seen here, the medical and nursing personnel is probably deficient; there are but 3 women nurses. Only 200 patients are present, and this is one of the hospitals that the Russians particularly wanted the Japanese to fill. It could, if necessary, take 600 to 800 patients comfortably. The plumbing arrangements are modern, though inadequate for hospital purposes. Next visited the Russian barracks in the new town. These are administered by the Russians and have the same faults of construction as the old town barracks described yesterday. They were filthy, but had been cleaned a good deal, and this cleaning is still going on. They have both Russian and Japanese patients. Hence went to some houses on a hill back from the bay which were being used as a hospital under the Japanese. This was the only place where there was serious ground for complaint. The houses were, in the first place, ill adapted for hospital purposes, being cut into small rooms, with deficient window space. In the lower story, on account of the high hill behind them, they were half subterranean. The yards in the rear had been policed and the lower one was clean, but another, at a higher level, was filthy; it is understood that it was to be cleaned the next day. The rooms for wards were greatly overcrowded. The men had bunks and were warm enough; they had no hospital clothing. The only closets were primitive Japanese ones in the yard, and it was a great hardship for some of these seriously sick men to reach them, especially from the upstairs rooms. Some of the cases of scurvy here were severe, and a few men were said to have dysentery. They were reported to have been evacuated from the Tiger's Tail Hospital, a fine-looking structure across the bay. This was effected six days ago, and the Russians stated that several had died since, two in the largest room. Some of these patients were being sent to other hospitals while I was present. If these were all the patients from the Tiger's Tail Hospital, the Japanese could hardly be expected to maintain it or to do so in any event, as from its situation it was particularly hard to supply. The fact remains, however, that humanity demanded the prompt removal to better surroundings of at

least 30 men in this hospital. It is understood that the Japanese had arranged to do this as promptly as possible. The kitchen had nothing in course of preparation except a soup.

Next the navy hospital at the south end of the bay was visited. This is far and away the best hospital in Port Arthur. It consists of four large pavilion wards and a two-story administration building. The house of the chief surgeon is now occupied as an officers' ward, and a large two-story barrack building holds other patients. The pavilions were built for 100 patients each; but by utilizing small rooms in them, intended for other purposes, their capacity has been considerably increased. They have floors, with a hard finish, and are heated by steam, having ventilators in the upper parts of each ward, surrounded by steam pipes. Modern water-closets, eight in number, are located at the end of each ward in a separate room. Each ward has a kitchen in which, strange to say, is a bath tub. The wards are too wide and have two rows of beds longitudinally, with an extra row running along each end. The patients are clean, and some of them have hospital clothing, furnished by the Japanese. The officers' ward is in the same class of building. As it is a residence, it is broken up into small rooms, all of which are occupied. The barracks is a large two-story structure. Four rows were placed in the wards, each holding 140, crowded. The bathing facilities are very limited, and the closets in this building are poor. The hospital has now some 700 patients, but it has contained more than 3,000 at times. More than 50 officers are at present under treatment. Each of the permanent wards has an operating room, or a room which can be so used, but one ward is especially devoted to surgical cases and has an excellent operating as well as a dressing room. The cases in the hospital consist principally of scurvy and wounds; but there are some also of incipient tuberculosis, nephritis, and other organic diseases. An unusual case of scurvy was shown me, in which the cartilages had separated from the ribs, and there was depression of the sternum. The surgeon said this had occurred in a number of cases. The surgeon second in rank is an extremely clever, fair-minded man; his name is Nicholowsky. He said they had about 40 cases of

typhoid under treatment at one time, but that dysentery was much more prevalent. All the water for both troops and hospitals was boiled; this is still being done at this hospital. He says that scurvy began to occur very early last spring. The Russian ration (he speaks especially of the navy) is not good and was cut down in the expectation of a long siege. This, he thinks, was a mistake, as they might have kept the men up much better with a full ration; and, at the last, there were a number of horses, which might have been killed and eaten. Just before the surrender the food became rather reduced: salt beef, preserved cabbage, a little tea, no bread. It would seem that there should have been plenty of flour, as a steamer, with such a cargo in large amount, ran the blockade just before the surrender. There were undoubtedly defects in the distribution of the few food stores they had. Doctor Nicholas says the Japanese soldiers were admirably disciplined and had given him no trouble. He is now having a little difficulty about food, though the worst cases seem to be liberally supplied with milk, some eggs, beer, brandy, bread, meat, etc. He states further that the reason that the Japanese have closed hospitals is that they have not sufficient personnel to run them nor enough supplies.

RUSSIAN HOSPITALS IN MUKDEN.

On the date of my entrance into Mukden, March 11, several of the hospitals were visited, which, at that time, were still being administered by the Russians. These were both Red Cross and military. It appears, as might have been expected, that there was always considerable friction between the military surgeons and the aid societies. This was loudly voiced at Mukden, as it was at Port Arthur. The Red Cross had as delegates men of prominence in Russia, not physicians, and they appealed to General Kuropatkin direct, who is said to have often supported them against the military medical officers, whom the Red Cross people represented as incompetent. At Mukden only the seriously wounded were treated; lighter cases were sent to Tiehling, and medical cases were forwarded back to Harbin. Mukden had about 2,000 beds, and in the nonactive times of December about 250 were

sent north by train daily. The number of such cases frequently reached over 1,000 when operations were active, as in the recent battle. These patients would sometimes arrive at Harbin within two days and at others not for six. The Red Cross delegate told me that they had brought in many patients from the advanced posts by push cars on a small movable track, such as is used frequently in large construction work in the United States.

Few Japanese wounded fell into Russian hands on the front of the Second Army, but the Third Army lost a number of wounded men to the Russians. Most of these were said to have been brought in on the 7th and many of them to have been on the field for two days. It is estimated that there were 1,200 Russian sick and wounded and 500 Japanese in the Mukden hospitals on the entry of the Second Army on the 11th of March. Chinese, or, possibly, some of the Russian nurses, had attempted to fire some of the hospitals the evening before, and had succeeded in burning some buildings, the largest being the big barracks of the Cossacks, used, with other barracks of the same organization, for the Red Cross hospital at Mukden station. This necessitated removing many patients, and everything was in the utmost confusion.

None of the Russian hospitals at Mukden station was very good, but some were considerably worse than others. The worst was undoubtedly the Red Cross hospital near the station. The wards for this are partially underground, patients lying on kahns slightly below the level of the ground, passageways being evacuated some $2\frac{1}{2}$ feet more between the kahns. The roof is supported by large wooden pillars, the eaves are at about the level of the ground, and the peak is about 12 feet above. There are a few glass windows in this roof, which is covered with earth. Inside, naturally, it was dark, and, as no provision was made for ventilation, the odor was horrible. Russian stoves were used for heating; there was no difficulty in keeping the wards warm enough. A Decker hut, about 75 feet long and 12 feet wide, had been erected for the operating room and the nurses' quarters. Russian surgeons speak well of this hut, saying that it can be set up in less than twenty-four hours, and is thoroughly

satisfactory for an operating room. It was heated by small stoves. During the battle a church had been used for operating also; this was a tent, double, with layers of felt interposed. The personnel lived largely in the Mongolian felt tents, and a few in dugouts. They had about 400 patients in this hospital on the 11th of March. The large Red Cross hospital was in the Cossack barracks, a few hundred yards distant from this. These were large stone structures, with glass windows and a longitudinal glass cupola running the entire length. This had been cut off by sheets of paper pasted below, and the ventilation was not good, though not nearly so bad as in the hospital just described. The latter hospital was divided into wards for about 200 patients, crowded; some of these were on the ground, but others were on a low wooden platform. Russian stoves were used for heating in all these hospitals. Patients were provided with beds or litters, only a few of the latter being used. The Russian litter is rather a miserable thing; it has wooden poles, with an iron transverse bar, which is hinged on one side and hooks into an iron collar on the other; the canvas or burlap bed has a loop at each side, through which the poles slide, and is fastened to the transverse bar by two leather straps; the iron legs are about 6 inches long, and when not in use fold toward the center on the litter poles. The beds were nearly all low wooden affairs which had been made on the ground. A number of two-wheeled carts on which these litters could be carried were seen. These have wooden wheels, iron axles, with a carriage spring attached to them, which carries two wooden bars, on which the litter rests, and straps for retaining it in position. The litter weighs about 22 pounds and this two-wheeled cart about 50, but the latter runs easily and would certainly save bearers. There were also some two-wheeled ambulances not destroyed; they were heavily built, but had light wheels and thin wooden sides, about 3 feet high and 1 foot of canvas above, with a wooden roof; at the back, under the body, were two drawers for stores. The length was not more than 6 feet; three men could be seated on a side and the seats folded. On account of their being so short a special litter was necessary, and the model adopted was an iron bed, with rather a thick mattress; this so filled the

ambulance that it was difficult to see how patients could be loaded. There was one good arrangement in this ambulance, however. On the ceiling longitudinal iron bars were placed in position, and from these the beds were suspended. This was done by leather straps, with loops at each end, between which a metal spiral spring was interposed. On the floor were two longitudinal metal bars, or, rather two metal bars made by pieces at a right angle, on which the beds could be slipped. These were supported by spiral springs, very stiff, with a rod through the center, which played through the floor of the ambulance. This spiral-spring arrangement might be successfully adopted in order to utilize various transportation for wounded. The Russians had succeeded in sending away many of their wounded by train; nearly all officers had been so forwarded. The last train for patients, so far as could be learned, left at 4 p. m. on March 9. Four directors of the Red Cross remained, as well as 2 military surgeons, 17 surgeons of the Red Cross, and 32 nurses of the same organization. Apparently the military hospital and the aid societies both depended largely for their personnel on details from the troops. They admit that these men were absolutely untrained, and were often drunkards and thieves.

A number of brain cases had been operated on in the Russian Red Cross hospital; these will be more fully spoken of under surgery. The bandages used were very generally starch and were good. They possessed the additional advantage of giving a smooth, white surface, which was used by the Russians by writing on them with an indelible pencil the date of injury, the date of operation, and the character of operation. On March 12 the majority of the Japanese patients under treatment in Russian hospitals were turned over to the Japanese authorities. The Russians were left to the care of their own surgeons. The Red Cross delegates were much impressed with the conduct of the Japanese in their strict observance of the Geneva Convention. Apparently an offer was made to turn the Russians over to their own outposts, or to take them to Japan. As the Russian army was retreating so rapidly, however, a considerable delay occurred. The Fifth Division of the Second Army remained in and

near Mukden, and its No. 2 field hospital took charge of all the Mukden hospitals, running them together and only sending inspectors to those where the Russians were in control. For this purpose, the personnel of Hospital No. 2 was supplemented somewhat from other field hospitals of the division. By the 17th of March the disorder of the hospitals had been somewhat corrected.

Information was received that the death rate had been very high among the Russian wounded during the battle of Mukden, higher than had been the experience of the Russian surgeons during the previous battles of the war. During the four days after the battle of Mukden Russian patients were continually coming to the Mukden hospitals. Many of these men were not seriously wounded, but had been cut off in the retreat in the various villages; a good many of them were undoubtedly willing prisoners. On the 24th some 700 Russian patients came in to the Mukden hospitals from a small village about 6 miles away, where there was some Japanese medical and hospital personnel and a sort of hospital had been established, but where, according to the Russians, the Japanese had very little for the patients, their diet consisting practically of bread and water. The Russian Red Cross delegate stated that, as soon as he called their attention to this, the patients were brought where they could have better care. It is understood that only the chief delegate and his first assistant are to be delivered to the Russian outposts, the other personnel going to Japan. There has never been any refusal on the part of the Japanese to deliver them at the outposts, in accordance with the third article of the Geneva Convention, but the Red Cross director complains of delay, which was excused on the ground that wagons were not procurable.

IMPERIAL UNIVERSITY HOSPITAL AT TOKYO.

This institution was visited; information had been received that it was the best hospital in Japan, and comparison with the military hospitals seemed desirable. As the better class of medical officers are graduates of this institution, it was to be expected that other hospitals would be modeled rather closely on it, and this was found to be the

fact. The university hospital is in permanent buildings, of stone, with tile roofs, but the plan is exactly that of the military hospitals, except that all passageways between the pavilions are entirely inclosed, and that the individual pavilions are 60 feet apart. The ventilation is not as good as that in the military hospitals; this is on account of the inclosed pavilions. Steam heat is supplied throughout. The equipment is excellent; there is a good operating room, of our model of about ten years ago, before we became so extravagant in the use of marble and glass, and fine laboratories in a new series of buildings, which have just been completed. Everything is on German models, as far as may be. Kelly pads were among the few American appliances seen. The library has a good collection of German books and periodicals. The water-closets are the usual Japanese type. The sterilizer of the operating room has no double skin, but small pails with shutters are used for dressings; these are first opened, so that the steam will penetrate into them, and then are removed from the sterilizer, closed, and put back, so as to dry the contents. Such a method of sterilization of course does not possess any advantage over our sterilizers. While the Imperial University Hospital is an excellent institution, a more full description is hardly within the limits of my inquiry.

INSPECTION OF ARMY MEDICAL SCHOOL IN TOKYO.

This school was inspected on January 10, 1905. It is in a large and good building, not far from the War Department. The sources from which the students at the school come are stated in the body of this report. The library at the school is a small one, consisting almost entirely of German books, none of which is very recent in date, and a few old English hygienes. The school has both chemical and bacteriological laboratories in a few rooms on the principal floor. A number of models of foreign litters, hospitals, crematories, pack saddles, equipment, and clothing are exhibited; these might all be more complete, but the idea seemed an excellent one to me, their desire evidently being to acquaint their students with everything of sanitary interest to medical officers—that is, of course, except foods. German models also predominate

here. The school was not in operation at the time of my visit. The largest number of students they have had in any one year was 40. The subjects taught are noted in the body of this report.

REPORT OF INSPECTIONS OF THE PRINCIPAL SUPPLY DEPOT OF THE
MEDICAL DEPARTMENT AT TOKYO, JAPAN.

This depot was inspected on January 11, 1905, and also in October of the same year. It is located in Kojimachijiku, not far from the War Department. Its large storehouses and workrooms are on both sides of the street. Some of these are permanent buildings of stone with tile roofs, but the majority are temporary wooden structures, and many of the latter are mere sheds. An apothecary officer with the rank of colonel is in charge, with 8 apothecary officers as assistants. The total working force, including many women, is not much less than 600. Two intendance officers are attached. They, with their assistants, the apothecary officers and a few chief nurses, are the only part of the depot force which is military, all others being civilian employees. Information was received that the depot was a small one before the war, and not many supplies were stored in it, as it was intended that each division should be fully equipped, and there was therefore no great necessity for this institution to store the great quantities of field medical supplies which must be instantly available on the outbreak of war. At present there is no large reserve stock of supplies in the depot, but purchases are continually made here from merchants, and articles so purchased are immediately sent to Manchuria or to divisions, in those rare instances when the division hospitals are not able to buy certain articles.

In my earlier inspection, we first entered a shed in which were stored a large number of Japanese pocket stoves of different sizes, with the charcoal for them. These were being shipped to Manchuria, principally for the use of patients undergoing transportation by rail. We then went into one of the rooms in which drugs were being prepared. Here the employees, under the observation of an apothecary officer, were making the creosote pills which are issued to each

soldier. The methods for the preparation of these pills were primitive, everything being done by hand or by hand machines. I had previously been informed by a friend in business in Yokohama that the Japanese had made enormous purchases of creosote abroad. They issue but six tablets—antiseptic, morphine, cocaine, stomachic, salicylate of soda, and calomel. These are also made with hand machines. In another room a great amount of magnesium sulphate was being packed in paper bags. In still another the larger tablets were being stamped by hand with a Japanese seal. The tablets, after being stamped, are tightly rolled in a little cone of paper, 10 tablets in each roll. These are put in tin boxes, which have tight covers sealed with plaster. The only cases which were in process of being filled were the small ones for medicines which are carried by the chief nurses. These are flat and are made of leather; the whole lid at the front is on a hinge, and at the back are finger holes, so that the bottles may be pushed out without difficulty. The bottles in the cases contain morphine in solution, tubes of morphine in a bottle, menthol brandy, camphor in oil, calomel, and a few other drugs. Their thin glass flasks of morphine solution for hypodermic use, are good, as it is so often difficult to procure water in the field. Bottles are packed in straw, usually a dozen to a box. The Japanese are especially skillful as packers. They take a long straw, which covers both the bottom and the sides of the box, and then wrap each bottle separately. All supplies except bottles are packed in sealed tin cases, soldered, before they are put into the wooden boxes. The boxes, which are of five sizes, all small, are of pine; they are marked at the top and ends with a list of the contents and the red cross. At each end of the box there is a central brace outside. Through the upper end of this a rope runs, which is placed here to facilitate transport.

At the second visit to this depot, as by that time the war was over, the personnel had been much diminished and little work was going on, except the repacking of some medical chests captured from the Russians. A number of articles of Russian medical equipment had been collected at the depot. This time an opportunity was afforded to visit the model

room, which is in the top story of the administration building. Here all articles of medical equipment in use by the Japanese army are on exhibition, as well as some from other nations. Nothing which had not been previously seen in the field was discovered here, except the model of a sled, which is used in northern Japan during the winter months, and some new and more elaborate chests for the examination of water at field hospitals. It should be noted that all articles used by the medical department, except its mounts, carts, packs, trains, ships and boats, buildings, and hospital clothing, are provided by this department. The staff of the depot was now engaged in the study of foreign first-aid packets, with a view to improving their own packet.

APPENDIX NO. V.

SANITATION.

REGULATIONS FOR THE PHYSICAL EXAMINATION OF CONSCRIPTS.

(War Act No. 3, March 18, 1892.)

1. Physical examination will be executed in accordance with the conscription law, to ascertain whether adults called are fit or unfit for military service.

2. The following causes unfit for service: (1) Severe abscesses, (2) rickets specially affecting bones, (3) leprosy, (4) aneurism, (5) epilepsy, (6) idiocy, (7) insanity, (8) loss of sight, (9) loss of cartilage of ear or nose, (10) deafness, (11) dumbness, (12) diseases of lips, jaw, or mouth which prevent normal life, (13) narrow chest, (14) abnormality of spine which interferes with movement, (15) deformity, (16) abnormal form of joints, (17) hernia, (18) crooked or short limbs, (19) stiffness of joints of fingers so that the hand does not grasp well, (20) loss of thumb or index finger or any other two fingers, (21) flatfoot, (22) loss of great toe or any other three toes.

In addition to the above, those that are otherwise physically unfit for service will not be passed on examination.

Standard of height of conscripts for the army and navy.

[War Act, April 7, 1898.]

Army:

Infantry, taller than 5 shaku.^a

Cavalry, taller than 5 shaku.

Field artillery, taller than 5 shaku 4 sun.^b

Fortress artillery, taller than 5 shaku 4 sun.

Engineers, taller than 5 shaku 4 sun.

Train, taller than 5 shaku.

Artillery (auxiliary), taller than 5 shaku 2 sun.

Artillery train, taller than 5 shaku.

Nurse, assistant, taller than 4 shaku 9 sun.

Tailor, private, taller than 4 shaku 8 sun.

Shoemaker, private, taller than 4 shaku 8 sun.

^a One shaku equals 11.9305 inches.

^b One sun equals 1.1931 inches.

Navy:

Seaman, for deck and other service, taller than 5 shaku 2 sun.

Engineering department, taller than 5 shaku.

Band, taller than 5 shaku.

Carpenter, taller than 4 shaku 9 sun.

Smith, taller than 4 shaku 9 sun.

Nurse, taller than 5 shaku.

Cook, taller than 4 shaku 9 sun.

NOTE.—It is thought that slight errors exist in this table.

NOTE.—The heights here prescribed are those of 1892, and have since been changed by subsequent order.

PHYSICAL TEST OF SOLDIERS.

As stated in the text, soldiers are given a physical test some few months after they join the army. On July 30 an opportunity was given of seeing the test of some new conscripts, belonging to a telegraph section, at Tangschau-chintai. The men were said to have come from the Hoju and to have lately joined the active army. The character of the exercises for such trials of physical fitness varies considerably with the facilities. In this case, of course, all apparatus was necessarily improvised, but the officers had fixed the maximum requirements, and they carefully recorded the results in the case of each man. A few simple prizes, provided by the officers, were distributed to the winners. The exercises consisted of the jump of a 3-meter ditch, an obstacle race of about 200 yards over the ditch, up and over a platform about 5 feet high, over a bar 6 feet high, over a Chinese wall 4 feet high, under a rope lying on the ground, and a jump over a rope at a height of $2\frac{1}{2}$ feet, and then a short straight run to the finish. After this, each candidate had a swing on a rope loop, in which he had to raise his feet to clear the ground, a passage across a parallel bar, chinning the bar, a jump to the same bar from a stool, so as to get one hand on the bar and the other elbow on it, being compelled to raise himself against the bar at the full length of the arms. Each man then went to the platform and was required to raise himself to it by grasping its top and front with the hands and turning over on it; then each candidate sat on the platform and sprang off to a certain distance. After this there was another exercise on the

swing; finally, the best men did what tricks they could on the bar and the platform. The prizes were apparently only awarded for this last work. None of the men was particularly skillful, though all who competed were fairly good and of a very even order of excellence. The value of their system is, of course, that no attempt is made to produce individual preeminence, but to make all conform to a certain minimum.

Japanese food ration table.

Principal food:	Regular issue.	Articles for substitution.	Remarks.
Rice	gills.. 7.6286	Steamed and dried rice..... gills.. 6.3680	3.17 quarts water, if necessary, are supplied per man for cooking and drinking.
		Bread	
		Biscuit..... gills.. 572.40	
Additional foods:		(One of these three.)	
Meat, canned.....	dramas.. 84.8	Beef without bone..... do... 84.8	If it is possible to obtain 127.2 drams of raw beef (169 drams with bone) it may be given.
		Beef with bone..... do... 108	
		Salted, dried, or smoked beef..... do... 63.60	
		Eggs..... do... 84.8	
		(One of these four.)	
		Raw vegetables..... do... 254.40	The seasoning articles, miso, salt, and sugar, are given when necessary.
		Rice, braised..... do... 81.80	
		Rice, salted..... do... 81.80	
		(One of these.)	
		Shoyu..... gills.. .008	381 drams of biscuit may be given instead of steamed and dried rice.
		Miso..... grams.. 42.4	
Iron ration:			If other things are supplied their cost shall not exceed that of the articles mentioned.
Steamed and dried rice.....	gills.. 8.81		
Canned meat.....	drams.. 84.80		
Salt.....	do... 6.36		
Extra articles:			
Sake.....	gills.. 2.54		
Brandy or shochu.....	gills.. .008		
Sweet cake, not more than.....	drams.. 68.60		
(One of these three.)			
Cigarettes.....	do... 20		

Umeboski : Salted plums, which are said to never decay.

Fukujin suke : Several kinds of chopped vegetables salted and canned.

Extract shoyu : Soy made from beans or peas (sauce to be mixed with boiled vegetables).

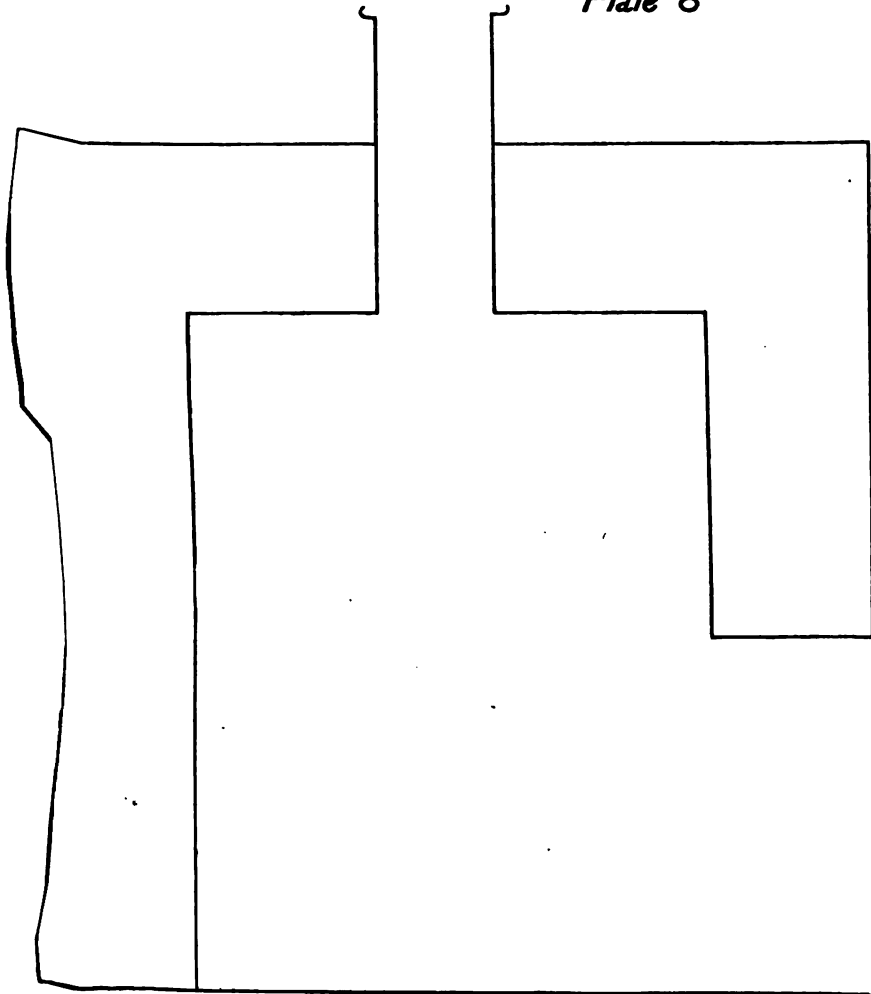
Miso : Remains in beans or peas when soy is extracted; is the solid part. It is used for thick soup (usually taken in morning).

Schohu : Weak alcohol from rice.

Regulation Water Boiler for Troops

Vertical Section

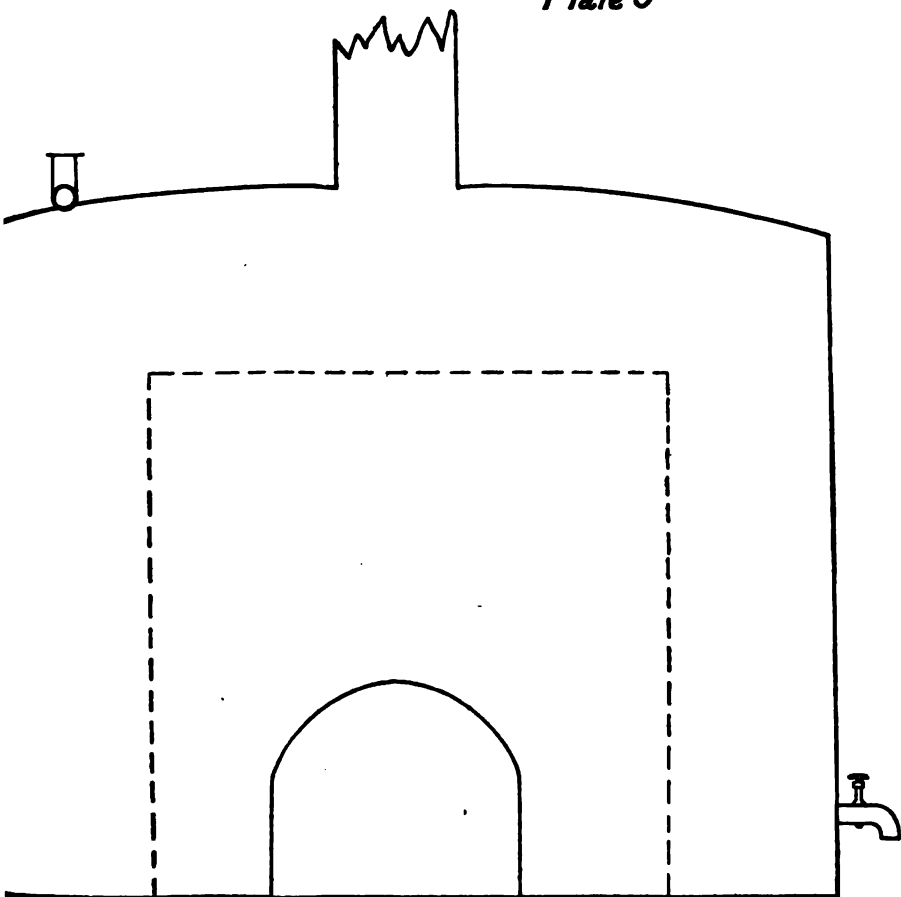
Plate 8

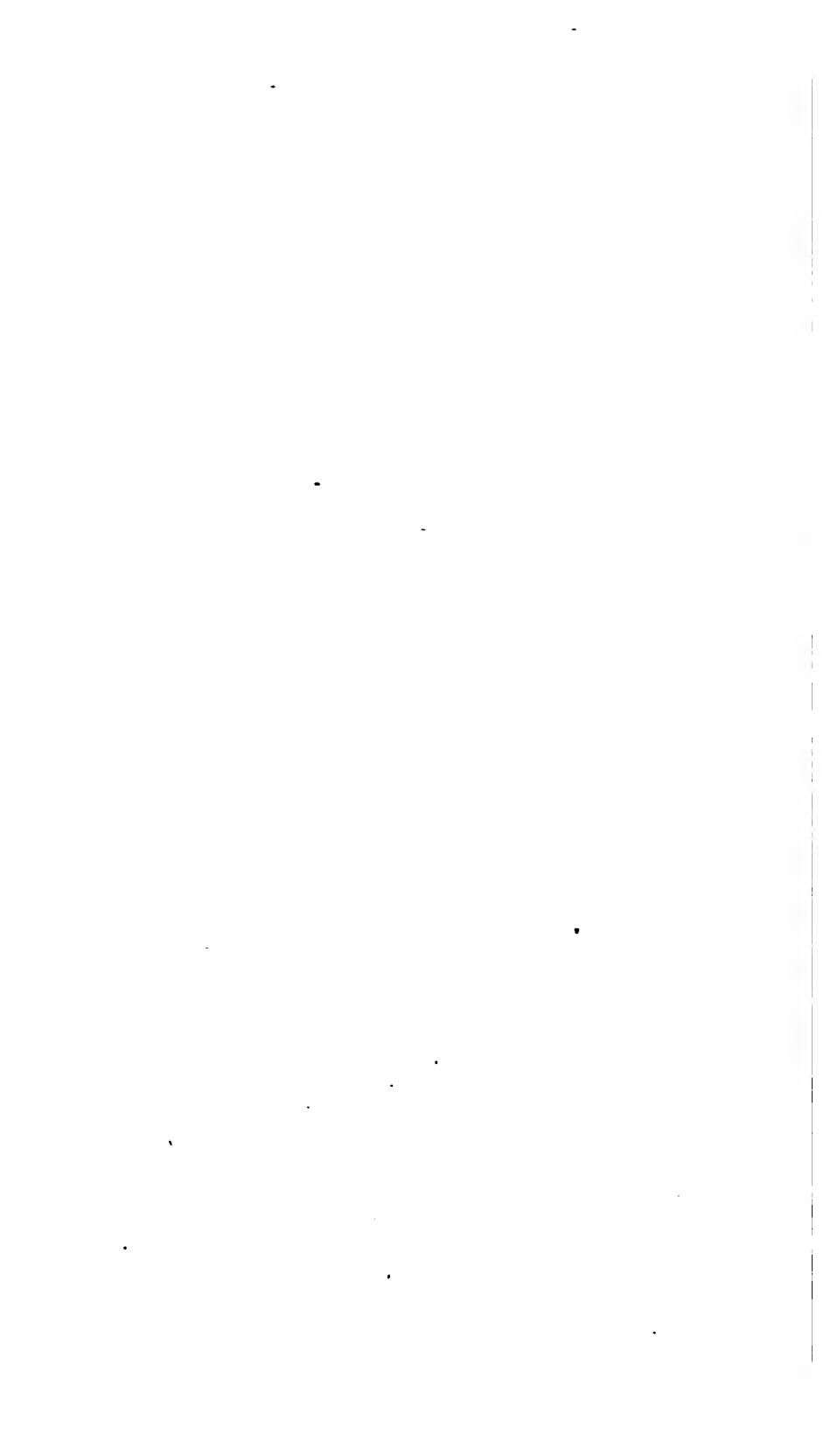


Regulation Water Boiler for Troops

Front view

Plate 9





APPARATUS FOR DRIVING WELLS.

During the summer of 1905 the Japanese drove a number of wells in the towns occupied by troops. Though, so far as observed, very few of these wells were successful in obtaining a free flow of water, the apparatus employed for sinking them was of some interest to an army sanitarian. It is understood, of course, that there are many better machines for such work, but the one that the Japanese employed might prove of value to an army under certain circumstances, as it did not necessitate elaborate apparatus, and with unlimited labor, as is found in an army, the rate at which a well was sunk by it was fairly rapid.

In sinking the well, first two heavy ladders, one above the other, bound together with ropes, were raised and guyed; each was about 20 feet long. Bound to the upper ladder, extending above it, a bamboo pole was raised and separately guyed. This pole was hollow. Three wooden poles, each about 20 feet long, were raised in a triangle and guyed in such a manner as to give support to the ladder upright. A small hole was then dug in the ground at the foot of the ladder and iron bars, each about 10 feet long, were riveted one to the next until they reached from the ground into the hollow bamboo pole. A side bar, a 5-inch timber, was then lashed to the ladder at the height of about 2 feet from the ground; this was horizontal and its outer end was lashed to one of the posts which formed the triangle which supported the ladder upright. A log lifting pole, also a 5-inch timber, was placed above this, so that six or seven men could press down on its farther end. Around the iron bar at its lower end a piece of iron was placed with a collar at its lower end; the piece of iron had a slight belly, which fitted around the horizontal bar, and a hook at the upper end which went around the iron bar above the lifting timber. When this was lifted the iron bar was raised about 3 inches. The distance gained was retained by another piece of iron about the iron bar below. After the bar had been raised into and above the bamboo pole, more joints were added to the iron bar; as the hole deepened the upper hook was knocked off and the bar fell, digging a little distance each

time this process was repeated. As will have been seen, the hollow bamboo pole served simply as a guide to the iron digging bar. This bar was the same in each link except the first one, which had a rather blunt point for digging.

"ISHIJI" FILTER.

[Under directions of Doctor Okada and Doctor Totsuka.]

HOW THE FILTER SHOULD BE USED.

The filter should be hung up at a proper place and then "F" and "C" should be tied; next, water requiring filtration will be poured in and the colored drug used for precipitation will be added to it, then it will be stirred, waiting until the water becomes colored.

The amount of the drug to be added to the water will be as follows: To ordinary water, 10 grams to 1 to (1 to is about 4 gallons); to dirty water, 40 grams to 1 to. But the amount will depend somewhat upon the effect; the proper quantity will be that which imparts a considerable color to the water.

After the water has been well colored by the above drug the other reagent for decolorization and for destroying bacteria will be added, the water will be stirred and a wait will be made until the color disappears. The quantity of the second drug will be as follows: Six grams to 1 to of ordinary water; 23 grams to 1 to of dirty water.

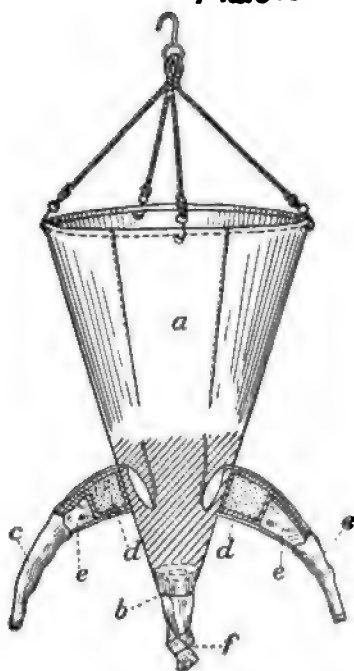
Some differences in amount will occur with different waters, but the proper quantity may be estimated as that sufficient to effect decolorization.

When the color has disappeared ten minutes will be allowed to elapse before it is ready for use. At the end of that time the water is fit for drinking, as the bacteria have been destroyed. Then "C" may be opened and the water collected.

SPECIAL POINTS TO BE OBSERVED.

Sometimes the coloring matter of drug No. 1 will be pink. This is only because the drug contains moisture and is not from chemical change. There will therefore be no difference in effect when using.

Isiji Filter
Plate 10



When water is drawn from "C" it will be better to do so slowly. In order to do this the sponge in "E" must be placed so as to fit tightly. This will insure very clear water.

The ten minute period after decolorization is the absolute minimum for the necessities of the battlefield, and when possible it is desirable that twenty or thirty minutes be given for this.

After the filter has been used "F" will be untied so that the precipitates may be removed, and the inside of the filter should be well washed. The charcoal in "D" and the sponge in "E" should also receive a thorough washing.

Results of the examination of the Tokyo city water.—These are said to have been very successful, reducing the number of bacteria to from 15 to 158 per cubic centimeter.

CAPACITY OF FILTER.

The largest size gives 39.7 gallons in thirteen minutes or about 183 gallons in an hour; the medium size, 24 gallons in thirteen minutes or about 111 gallons in an hour; the smallest will give about 6 gallons in thirteen minutes or about 26 gallons in an hour; a small portable filter is also made which will filter about 2 quarts in five minutes (this is said to be the correct reading of the circular, but it is probable that an error has been made, as it is claimed in all these filters that ten minutes must elapse after the second reagent has been added).

The size and weight of the different filters are as follows: Large, diameter 3 feet, weight about 8.3 pounds; medium, diameter 2.5 feet, weight about 8.2 pounds; small, diameter 1.5 feet, weight about 4 pounds.

LAW FOR THE PREVENTION OF EPIDEMICS.

(Law No. 36, March 30, 1897.)

1. Under this law epidemics will be held to include cholera, dysentery, typhoid fever, smallpox, typhus fever, scarlet fever, diphtheria, and plague.

2. The administrative authority may order the application of this law in part or wholly on cases simulating epidemic diseases.

3. When a physician attends a patient suffering from an epidemic disease or visits dead in consequence of such a disease he must explain the proper methods of disinfection to the family and report immediately to police headquarters, to the chief of the city or town administrative office, and to the quarantine committee.

4. When a family discovers a patient suffering from an epidemic disease, or a disease resembling it, or dead in consequence of such a disease, they shall immediately ask for the diagnosis of a physician, and shall report as required in the preceding paragraph. The person obliged to make such a report in accordance with the above will be the master of the house if the disease occur in a family. In a temple, school, factory, ship, company, or office, etc., its chief master or controller will be held responsible.

5. The family where an epidemic disease has occurred and even any other family which might be infected or might be doubtful of infection shall carry out disinfection under the directions of the physician or the quarantine committee.

6. Details in regard to cleaning and disinfection will be regulated by order.

7. The proper authority can order, if necessary, that the patient suffering from an epidemic disease be taken to a hospital for epidemic diseases or to a ward for their isolation.

8. Communication can be ordered stopped for a certain period with the house where the case of epidemic disease occurred. Those who may be infected can be properly isolated.

9. The patient with an epidemic disease, or his body, shall not be allowed removed without the permission of the proper official.

10. Anything that is infected or of which infection is doubtful by an epidemic disease shall never be used, transferred, deserted, given away, or washed without permission of the proper official.

11. The body of a patient who has died from an epidemic disease shall not be buried unless the means taken for its disinfection are recognized by the proper official to be sufficient and effective. The body of an epidemic patient will be buried within twenty-four hours after the physician has

made his diagnosis, with the permission of a proper official.

12. The body of a patient dying from an epidemic disease shall be burned; however, this will not be held to be applicable when proper permission for burial has been obtained. In case the body is buried, removal will not be allowed until three years have expired.

13. When a body has been recently buried or is about to be buried, and there is doubt in reference to whether the disease was an epidemic one, the proper official may order that necessary measures be taken in regard to the body, the house, and other articles.

14. In case of necessity in respect to epidemic prevention, the proper official may demand admission from the master of a family or other person in charge to such places as he must enter for investigation. In such a case the official will show his official certificate.

15. In case an epidemic prevails or there is fear of it, an epidemic prevention committee will be elected in accordance with city, town, or village regulations. Physicians shall be included among the members of this committee.

16. The city, town, or village shall enforce proper measures for cleaning and disinfection under directions of the governor, and shall hire necessary personnel and furnish required supplies, and shall also take proper measures for killing house rats.

17. The city, town, or village shall establish an epidemic hospital and a plant for disinfection. In case the use of water of wells is forbidden in consequence of the application of Articles XIX, VII, and VIII for the whole or a certain part of a city, town, or village a proper supply of water will be arranged for under directions of the governor.

18. When an epidemic prevails or there is fear of it, the governor will appoint the quarantine committee for quarantine affairs. A quarantine examination will be enforced for trains and ships. At this examination doubtful cases among passengers, crews of ship, or workers of train shall be detained for the necessary period of time for isolation and examination in the places set apart for such purposes, or the proper official or physician will be sent to embark on the train or ship to make the necessary examinations.

Persons suffering from epidemic disease at the quarantine examination will be taken to the epidemic disease hospital of the city, town, or village. Doubtful cases will be taken to the hospital for temporary isolation nearby. The above will be practiced with cases of epidemic disease and with doubtful cases on board ship or train, even when the quarantine examination has not been made. The regulations for the quarantine committee and examination will be made by special order.

19. The governor may, in case it is necessary to prevent epidemics, enforce a part or the whole of the following rules:

(1) Examination of living as to health or examination of bodies.

(2) Suspension of communication with a part or the whole of a street or the isolation of citizens.

(3) Prohibition or restriction of gatherings or meetings of people for festivals, theatrical performances, etc.

(4) Prohibition or restriction of the removal of old clothing, rags, old cotton, or any other articles that are liable to spread infection, or their destruction.

(5) Prohibition or restriction of the sale of food or drink that is liable to be the medium of infection.

(6) The hire of physicians or the purchase of necessary supplies for trains, ships, factories, or for any other places where a number of people congregate together.

(7) Practice of proper methods of cleaning and disinfection.

(8) Restriction or suspension of fishing or swimming in certain bodies of water, and the use of water.

(9) Killing the rat family.

When the proper officials deem that some buildings are not properly and effectively disinfected, the governor may apply to the Home Minister for permission to take special measures. In this case the owners of buildings suffering loss will be compensated.

20. In case epidemic diseases occur, or it is feared that they will occur in various administrative offices, prisons, schools, hospitals, factories, etc., those in charge of them will take the proper measures of prevention in accordance with this law after consultation with the governor.

21. The following expenses will be paid by a city, town, or village:

- (1) Expenditures for the quarantine committee.
- (2) Expenditures for cleaning, disinfection, and vaccination.
- (3) Expenditures for the hire of physicians and other personnel, for the purchase of supplies, medicine, etc.
- (4) Expenditures for the epidemic disease hospital, for the place for isolation and for that for disinfection.
- (5) Expenditures for the pay of personnel who are concerned in work connected with the prevention of disease, and allowance to their families if they die in service.
- (6) Expenditures in reference to the suspension of communication provided for under paragraph 8, and allowances to people suffering from the enforcement of this paragraph.
- (7) Expenditures for the treatment of epidemic cases among the poor and for the disposal of their dead.
- (8) Expenditures in reference to the killing of house rats.
- (9) Expenditures in supplying water as provided for under paragraph 17.
- (10) Allowance of compensation provided for under paragraph 19.

22. The following will be paid from "Fu" (Tokyo, Osaka, and Kyoto) or "Ken" (other prefectures) taxes:

- (1) Expenditures under paragraph 18.
- (2) Expenditures under paragraph 19, except compensation.
- (3) Under paragraph 18 an allowance to the poor who suffer from the suspension of communication.

23. The governor may order the establishment of sanitary boards for the execution of cleaning and disinfection. The sanitary boards may pay a part of the expense in connection with the prevention of epidemics in cities, towns, or villages.

24. The expenditures provided for under paragraphs 21 and 23 may be supplemented by "Fu" or "Ken" taxes by order.

25. The national treasury shall pay one-sixth of the expenses provided for under articles 22 and 26.

26. In case persons required to clean or disinfect under this law do not do this, the proper official will carry out such cleaning or disinfection at the expense of the city,

town, or village. In such a case the city, town, or village may afterwards compel those persons interested to reimburse them for these expenditures. In case persons have cleaned or disinfected in an unsatisfactory manner, the above will apply.

27. In case a city, town, village, or an individual does not execute properly any affairs, measures, or practices provided for under this law, or in case such have been done in an insufficient manner or have been executed too tardily, the governor may order proper measures at the expense of "Fu" or "Ken" taxes. Afterwards he will require the city, town, village, or individual to make reimbursement.

28. If individuals who are obligated to pay expenses in accordance with articles 26 and 27 by direction of the city, town, village, or governor disappear, recourse may be had to the petition law.

29. Persons who do not obey the directions of the proper officials as provided for under this law will be required to pay a fine of less than 5 yen.

30. In the case of a physician who attends epidemic cases or examines bodies of those dying from epidemic diseases and does not report to the proper authorities within twelve hours or makes a false report, he will be punished by a fine of from 5 to 50 yen.

31. The following persons will be punished by fines of from 2 to 20 yen:

(1) Violators of paragraphs 4, 5, 9, 10, first item of 11, and 12.

(2) Violators of suspension of communication.

(3) Those who give false statements or refuse to give statements to the proper official.

(4) Those who request a physician not to make a report required by paragraph 3.

32. In addition to this law other necessary regulations may be made by Hokkaido and Okinawa prefecture.

33. Special regulations will be made for the quarantine examination of ships from abroad and from Formosa.

34. The necessary regulations for the execution of this law may be enacted by order.

35. This law will be put into force from the 1st of May, 1897.

REGULATIONS FOR THE PREVENTION OF EPIDEMIC DISEASES IN
THE ARMY.

(War Act No. 19, April 28, 1897.)

1. The law for the prevention of epidemics (No. 36, law of 1897) shall be followed for the prevention of epidemic diseases in the army. In addition, the following shall have force and effect.

2. In case epidemic diseases are discovered in troops or epidemic diseases seem likely to prevail in districts in the vicinity of troops the commander shall report to the next higher commander.

3. When the higher commander receives the foregoing report he, the division commander, will consult with the division surgeon in regard to necessary measures of prevention. If it appears probable that a very severe epidemic is likely to occur report of the fact will be made to the Minister of War.

4. In case epidemic diseases prevail among troops, in their vicinity, or there is fear of them, the commander will appoint, by order, a prevention committee to attend to the necessary measures for the preventing of disease and for disinfection.

5. When epidemics prevail in troops, in their vicinity, or there is fear of them, the surgeon of the troops shall put into practice necessary and proper measures for preventing the spread of disease. With regard to affairs on which consultation should be had with administrative officers of cities, towns, or villages, the surgeon will make the necessary recommendations to his commander, who will correspond with the governor or the chief of a city, town, or village.

6. The surgeon of troops shall make a list of patients suffering from epidemic diseases in the troops and shall submit it to the division surgeon.

7. In case epidemic diseases prevail in troops before the admission of conscripts or the call of reserves the division commander will apply for necessary directions to the War Minister. The same will apply when epidemics prevail in localities from which new conscripts are coming or reserves

town, or village. In such a case the city, town, or village may afterwards compel those persons interested to reimburse them for these expenditures. In case persons have cleaned or disinfected in an unsatisfactory manner, the above will apply.

27. In case a city, town, village, or an individual does not execute properly any affairs, measures, or practices provided for under this law, or in case such have been done in an insufficient manner or have been executed too tardily, the governor may order proper measures at the expense of "Fu" or "Ken" taxes. Afterwards he will require the city, town, village, or individual to make reimbursement.

28. If individuals who are obligated to pay expenses in accordance with articles 26 and 27 by direction of the city, town, village, or governor disappear, recourse may be had to the petition law.

29. Persons who do not obey the directions of the proper officials as provided for under this law will be required to pay a fine of less than 5 yen.

30. In the case of a physician who attends epidemic cases or examines bodies of those dying from epidemic diseases and does not report to the proper authorities within twelve hours or makes a false report, he will be punished by a fine of from 5 to 50 yen.

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REGULATIONS FOR THE PREVENTION OF EPIDEMIC DISEASES IN
THE ARMY.

(War Act No. 19, April 28, 1897.)

1. The law for the prevention of epidemics (No. 36, law of 1897) shall be followed for the prevention of epidemic diseases in the army. In addition, the following shall have force and effect.

2. In case epidemic diseases are discovered in troops or epidemic diseases seem likely to prevail in districts in the vicinity of troops the commander shall report to the next higher commander.

3. When the higher commander receives the foregoing report he, the division commander, will consult with the division surgeon in regard to necessary measures of prevention. If it appears probable that a very severe epidemic is likely to occur report of the fact will be made to the Minister of War.

4. In case epidemic diseases prevail among troops, in their vicinity, or there is fear of them, the commander will appoint, by order, a prevention committee to attend to the necessary measures for the preventing of disease and for disinfection.

5. When epidemics prevail in troops, in their vicinity, or there is fear of them, the surgeon of the troops shall put into practice necessary and proper measures for preventing the spread of disease. With regard to affairs on which consultation should be had with administrative officers of cities, towns, or villages, the surgeon will make the necessary recommendations to his commander, who will correspond with the governor or the chief of a city, town, or village.

6. The surgeon of troops shall make a list of patients suffering from epidemic diseases in the troops and shall submit it to the division surgeon.

7. In case epidemic diseases prevail in troops before the admission of conscripts or the call of reserves the division commander will apply for necessary directions to the War Minister. The same will apply when epidemics prevail in localities from which new conscripts are coming or reserves

are called, or when such conscripts or reserves must pass through localities where epidemics have prevailed.

8. The commander of troops will order the surgeon to examine conscripts and reserves called to ascertain if they are suffering from epidemic diseases. If necessary a place where they may be isolated for a certain number of days will be prepared for them.

9. When the surgeon of troops considers it necessary to remove healthy soldiers from the barracks he will recommend this to the commander, who must apply for directions from the division commander. The division commander will then consult with the division surgeon and will execute the removal after permission of the War Minister has been obtained.

10. When the director of a military hospital considers it necessary to establish an isolation hospital he will recommend this to the division commander who will consult with the division surgeon and will establish it after the permission of the War Minister has been obtained.

11. In a district where a city or town has an isolation hospital the division commander may hire a part of it after consultation with the proper authorities. The division commander may also allow cities or towns to hire a part of a military isolation hospital.

12. When epidemic diseases prevail in troops or in districts where they are located, soldiers may be forbidden to leave their station, or a certain part of the district only may be set apart in which they may go. Or an officer or noncommissioned officer may be ordered to conduct soldiers through the streets, they maintaining a proper formation.

13. A certain place shall be set aside for the burning or burying of the discharges of epidemic patients or of other things infected. When they are to be burned or buried at a special place in the district to which they must be carried the commander will consult with the proper district authorities.

14. In case epidemic diseases occur in the families of soldiers living out of barracks the permission of the commander must be obtained by such soldiers in order that they may come daily for service.

15. In cases under paragraphs 9 and 10, when troops are located in a place other than that of division headquarters and time does not allow the procedures outlined in these articles, their commander may take proper measures at once and report afterwards.

16. These regulations are not only applicable for the eight epidemic diseases mentioned in paragraph 1 of the law for prevention of epidemics, but will also be enforced when other epidemic diseases prevail.

17. The Formosan garrison will also be required to follow these regulations.

PROCEDURES FOR THE PREVENTION OF EPIDEMIC DISEASES IN THE
ARMY AND FOR DISINFECTION IN CONNECTION THEREWITH.

(War Act No. 70, May 31, 1897.)

1. This act has been enacted and will be read in connection with regulations for the prevention of epidemic diseases in the army.

2. The surgeon of troops must report the occurrence of epidemic diseases in troops to the commander and must take proper measures to prevent their spread. In cases of emergency he may report after such proper measures have been taken.

3. In cases falling under article 3 of the above-mentioned regulations the senior surgeon will call all the surgeons in the station into conference in reference to measures for the prevention of the spread of the disease. Measures decided upon in a place other than that where the division headquarters is located must be reported by the senior surgeon to the division surgeon.

4. When an epidemic disease appears in troops or in their vicinity the senior surgeon shall report the fact to other near-by troops.

5. When smallpox prevails in troops or in their vicinity an extraordinary practice of vaccination will be enforced. With other epidemic diseases cleaning and disinfection as may be required by the special disease will be strictly practiced. Special closets will be constructed for patients suffering from epidemic disease.

6. In case epidemic diseases occur in troops the senior surgeon will report, giving a list of patients, deaths, and recoveries.

7. The list of patients required under paragraph 6 of the above-mentioned regulations will be prepared by the surgeon. In this he will note a daily or weekly record of conditions in reference to prevailing disease.

8. The division surgeon is required to prepare a report of the number of patients, the dead, and recoveries in accordance with the foregoing list, and forward it to the Chief of the Medical Bureau of the War Department.

9. On the cessation of an epidemic the surgeon of troops must prepare a report mentioning the total number of patients, the causes of the epidemic, the dead, the recoveries, the character of the epidemic, and the measures taken for disinfection and treatment. This will be forwarded to the division surgeon, who will compile another report from it, which will be sent to the Chief of the Medical Bureau of the War Department.

10. For the prevention committee, paragraph 4 of the regulations, one or two medical officers will be selected. In some cases an intendance officer will be added to the committee.

11. The location for an isolation hospital must be chosen far away from the source of a stream, from that of the city water supply, and from the busy quarters of a city, town, or village. It must not be placed so that the prevailing winds will be from it to densely inhabited sections, and it must be convenient for the transportation of patients and supplies. In choosing a location prior consultation will be held with the proper administrative officers.

12. The wards of an isolation hospital must be four in number as follows: (1) For doubtful cases; (2) for slight cases of epidemic disease; (3) for serious cases of epidemic disease; (4) for convalescents. In the hospital an office for administration, a dispensary, a nurses' room, a room for disinfection, a room for bathing, a mortuary, and a kitchen must be established.

13. No one will be allowed to visit an isolation hospital without the permission of the surgeon in charge. The fam-

ilies of patients may be permitted to visit them at certain periods after necessary instructions have been given to prevent further spread of the disease.

14. The personnel of an isolation hospital shall not be transferred or changed unless necessity compels this.

15. Regulation coats will be provided for surgeons, chief nurses, and nurses.

16. The number of days during which doubtful cases will be isolated under paragraph 8 of the regulations will be six, beginning from the day on which such persons left the district, ship, or train where they came in contact with the epidemic disease. The surgeon is authorized to prolong or shorten this time.

17. The general methods for cleaning will be as follows:

(1) The room from which a case of epidemic disease came or the place which may be infected will be first disinfected and then perfectly cleaned. The dirt and rubbish will be burned.

(2) Canals and ditches will be cleared.

(3) Closets will be disinfected and cleaned.

(4) Dirt and rubbish collected will be disposed of at the appointed place.

(5) When necessary, wells will be cleaned and closets will be repaired or rebuilt.

18. The methods of disinfection will be four, as follows:

(1) By burning; (2) by steaming; (3) by boiling; (4) by chemicals.

19. The following will be burned:

(1) Straw mattresses, cotton of hospital dresses, cloths and things of little value, and articles that can be disinfected in no other way than by burning.

(2) Matters vomited and purged and other discharges.

20. The following will be disinfected by steam:

(1) Clothing, bedding, curtains, carpets, etc.

(2) Glassware, earthenware, porcelain, metal wares, etc.

21. In steam disinfection the following rules must be observed:

(1) Leather, gum, pasted and glued articles, wool, ivory, horn, etc., will be separated and not disinfected by steam.

(2) Before steaming it must be ascertained that no bullets

(cartridges), powder, matches, or other explosives are in the clothing or other articles.

(3) Streaming steam will be used. The period of time for disinfection will be longer than an half an hour at 100° C.

22. The following will be disinfected by boiling: Foods, undershirts, sheets, pillowcases, pillow slips, covers of mattresses or cushions, and coins, also surgical instruments. Boiling may also be substituted for steam disinfection in proper cases.

23. Drugs used for chemical disinfection are as follows:

1. Solution of carbolic acid, 1 to 20-----	{ Crystalized carbolic acid, 5 parts. Hydrochloric acid, 1 part. Water, 94 parts.
2. Solution of bichloride of mercury, 1 to 1,000--	{ Bichloride of mercury, 1 part. Hydrochloric acid, 10 parts. Water, 989 parts. A little fuchsin is added to color the solution.
3. Solution of chloride of lime, 1 to 20-----	{ Chloride of lime, 5 parts. Water, 95 parts.
4. Milk of lime, 1 to 10-----	{ Quicklime, 1 part. Water, 9 parts.
5. Powdered quicklime-----	{ Pulverized with a little water.

NOTE.—When milk of lime is used in place of quick lime double amounts will be employed.

Solutions of chloride of lime, milk of lime, and powdered quick lime shall be prepared immediately before using.

24. The chemicals specified in the foregoing article will be used as follows:

The solution of carbolic acid is effective for disinfection for all kinds of articles, but the following points must be observed when employing it:

(a) It will be used after being warmed.

(b) When disinfecting matter vomited or purged, or other discharges, it will be mixed in equal quantity with the matter requiring disinfection and will be well stirred.

(c) For disinfection of rooms or furniture, they will be wiped with a cloth wet with the solution, or it will be sprayed over them.

(d) In the disinfection of hands or feet, they will be washed first in the solution and afterwards with clean water.

The solution of bichloride of mercury is useful for the disinfection of the hands, wooden surfaces (as boards or doors) earthenware, glassware, and wooden ware, etc., but should not be used for disinfecting metal wares, matter vomited and purged, or other discharges. Neither should it be used for the disinfection of food and drinks, mats, carpets, etc.

Solutions of chloride of lime, milk of lime, and powdered quicklime are useful for the matters vomited, purged, and other discharges, canals and ditches, dirt heaps, and under floors. For the disinfection of the matter vomited, purged, and other discharges, one-fiftieth of their cubic measure will be employed.

25. Chemicals will be applied for disinfection as follows:

(1) Patients: When a patient recovers from an epidemic disease the nails will first be cut and, as a rule, the hands will be disinfected. The body will then be wiped with a warm solution of bichloride of mercury, a bath will be given, dirt being washed away with soap. The patient will then dress in new clothing.

(2) Bodies: The body of a patient who has died of an epidemic disease will have the clothing freely soaked in a solution of carbolic acid or of bichloride of mercury, or may be wrapped in cloths that have been soaked in the same solution.

(3) Persons who have come into contact with patients suffering from an epidemic disease must disinfect their hands each time that they handle the patient. When necessary, their clothing will be disinfected and they will be required to bathe.

(4) Vehicles for transporting patients or dead with epidemic disease will be disinfected each time they are used with the solution of carbolic acid or bichloride of mercury.

(5) Closets, tubs for bathing, heaps of dirt, canals, ditches, etc.: Earthenware vessels in which matter vomited, purged, and other discharges have been received will be disinfected with the solution of chloride of lime, milk of lime, or pow-

town, or village. In such a case the city, town, or village may afterwards compel those persons interested to reimburse them for these expenditures. In case persons have cleaned or disinfected in an unsatisfactory manner, the above will apply.

27. In case a city, town, village, or an individual does not execute properly any affairs, measures, or practices provided for under this law, or in case such have been done in an insufficient manner or have been executed too tardily, the governor may order proper measures at the expense of "Fu" or "Ken" taxes. Afterwards he will require the city, town, village, or individual to make reimbursement.

28. If individuals who are obligated to pay expenses in accordance with articles 26 and 27 by direction of the city, town, village, or governor disappear, recourse may be had to the petition law.

29. Persons who do not obey the directions of the proper officials as provided for under this law will be required to pay a fine of less than 5 yen.

30. In the case of a physician who attends epidemic cases or examines bodies of those dying from epidemic diseases and does not report to the proper authorities within twelve hours or makes a false report, he will be punished by a fine of from 5 to 50 yen.

31. The following persons will be punished by fines of from 2 to 20 yen:

(1) Violators of paragraphs 4, 5, 9, 10, first item of 11, and 12.

(2) Violators of suspension of communication.

(3) Those who give false statements or refuse to give statements to the proper official.

(4) Those who request a physician not to make a report required by paragraph 3.

32. In addition to this law other necessary regulations may be made by Hokkaido and Okinawa prefecture.

33. Special regulations will be made for the quarantine examination of ships from abroad and from Formosa.

34. The necessary regulations for the execution of this law may be enacted by order.

35. This law will be put into force from the 1st of May, 1897.

REGULATIONS FOR THE PREVENTION OF EPIDEMIC DISEASES IN
THE ARMY.

(War Act No. 10, April 28, 1897.)

1. The law for the prevention of epidemics (No. 36, law of 1897) shall be followed for the prevention of epidemic diseases in the army. In addition, the following shall have force and effect.

2. In case epidemic diseases are discovered in troops or epidemic diseases seem likely to prevail in districts in the vicinity of troops the commander shall report to the next higher commander.

3. When the higher commander receives the foregoing report he, the division commander, will consult with the division surgeon in regard to necessary measures of prevention. If it appears probable that a very severe epidemic is likely to occur report of the fact will be made to the Minister of War.

4. In case epidemic diseases prevail among troops, in their vicinity, or there is fear of them, the commander will appoint, by order, a prevention committee to attend to the necessary measures for the preventing of disease and for disinfection.

5. When epidemics prevail in troops, in their vicinity, or there is fear of them, the surgeon of the troops shall put into practice necessary and proper measures for preventing the spread of disease. With regard to affairs on which consultation should be had with administrative officers of cities, towns, or villages, the surgeon will make the necessary recommendations to his commander, who will correspond with the governor or the chief of a city, town, or village.

6. The surgeon of troops shall make a list of patients suffering from epidemic diseases in the troops and shall submit it to the division surgeon.

7. In case epidemic diseases prevail in troops before the admission of conscripts or the call of reserves the division commander will apply for necessary directions to the War Minister. The same will apply when epidemics prevail in localities from which new conscripts are coming or reserves

are called, or when such conscripts or reserves must pass through localities where epidemics have prevailed.

8. The commander of troops will order the surgeon to examine conscripts and reserves called to ascertain if they are suffering from epidemic diseases. If necessary a place where they may be isolated for a certain number of days will be prepared for them.

9. When the surgeon of troops considers it necessary to remove healthy soldiers from the barracks he will recommend this to the commander, who must apply for directions from the division commander. The division commander will then consult with the division surgeon and will execute the removal after permission of the War Minister has been obtained.

10. When the director of a military hospital considers it necessary to establish an isolation hospital he will recommend this to the division commander who will consult with the division surgeon and will establish it after the permission of the War Minister has been obtained.

11. In a district where a city or town has an isolation hospital the division commander may hire a part of it after consultation with the proper authorities. The division commander may also allow cities or towns to hire a part of a military isolation hospital.

12. When epidemic diseases prevail in troops or in districts where they are located, soldiers may be forbidden to leave their station, or a certain part of the district only may be set apart in which they may go. Or an officer or noncommissioned officer may be ordered to conduct soldiers through the streets, they maintaining a proper formation.

13. A certain place shall be set aside for the burning or burying of the discharges of epidemic patients or of other things infected. When they are to be burned or buried at a special place in the district to which they must be carried the commander will consult with the proper district authorities.

14. In case epidemic diseases occur in the families of soldiers living out of barracks the permission of the commander must be obtained by such soldiers in order that they may come daily for service.

15. In cases under paragraphs 9 and 10, when troops are located in a place other than that of division headquarters and time does not allow the procedures outlined in these articles, their commander may take proper measures at once and report afterwards.

16. These regulations are not only applicable for the eight epidemic diseases mentioned in paragraph 1 of the law for prevention of epidemics, but will also be enforced when other epidemic diseases prevail.

17. The Formosan garrison will also be required to follow these regulations.

PROCEDURES FOR THE PREVENTION OF EPIDEMIC DISEASES IN THE
ARMY AND FOR DISINFECTION IN CONNECTION THEREWITH.

(War Act No. 70, May 31, 1897.)

1. This act has been enacted and will be read in connection with regulations for the prevention of epidemic diseases in the army.

2. The surgeon of troops must report the occurrence of epidemic diseases in troops to the commander and must take proper measures to prevent their spread. In cases of emergency he may report after such proper measures have been taken.

3. In cases falling under article 3 of the above-mentioned regulations the senior surgeon will call all the surgeons in the station into conference in reference to measures for the prevention of the spread of the disease. Measures decided upon in a place other than that where the division headquarters is located must be reported by the senior surgeon to the division surgeon.

4. When an epidemic disease appears in troops or in their vicinity the senior surgeon shall report the fact to other near-by troops.

5. When smallpox prevails in troops or in their vicinity an extraordinary practice of vaccination will be enforced. With other epidemic diseases cleaning and disinfection as may be required by the special disease will be strictly practiced. Special closets will be constructed for patients suffering from epidemic disease.

1. INSTRUCTIONS FOR THE CARE OF THE BODY.

(1) Even trivial complaints, such as whitlow, boils, toothache, etc., reduce the fighting power of an army. These occur most commonly from the soldier being too lazy to wash himself. He must therefore be careful to wash every part of his body even in the field.

(2) As hot baths can not always be taken during war, the soldier must keep himself clean by rubbing the dirt off his body by means of a wet towel, especially from the armpits, the inside of the thighs, and the private parts.

(3) The hair must be kept closely cut and the head frequently washed in order to prevent lice and dandruff.

(4) The mouth must be washed out every morning and the teeth cleaned with a toothbrush and tooth powder in order to prevent decay of the teeth.

(5) The hands are especially liable to become dirty and whitlow, etc., are very apt to occur. Also the germs of disease are liable to enter the body from the dirt on the hands through cuts or by fingering food, etc., when the hands are dirty. It is necessary therefore to frequently wash the hands with soap and water.

(6) The feet, like the hands, are very apt to be dirty. Sweat condenses within the boots, decomposes and smells badly and causes inflammation and blistering. The feet must therefore be cleaned whenever quarters are reached for the night. Mounted men must, for the same reason, clean the inside of the thighs and the seat in order to prevent blistering from the saddle.

(7) Dirt under the nails often contains the germs of disease. The nails must, therefore, be cut short at the proper time, but they must not be too close, as then inflammation under the nails is apt to occur.

(8) During cold weather cracks and chilblains occur on the hands and feet, and they are very apt to be the means by which disease enters the body. The ointment that is issued for the purpose must therefore be rubbed over these after the hands and feet have been washed.

2. INSTRUCTIONS REGARDING CLOTHING.

(1) The chief purpose of clothing is protection from the cold, but if too much clothing is worn sweating occurs, and this is bad. The soldier must, therefore, wear during work that amount of clothing only which will cause neither sweating nor the sensation of cold. In the case, however, of the soldier resting for any length of time or being on sentry or outpost duty, he must wear more clothing.

(2) The principal article of clothing for preventing cold is the overcoat. It must, therefore, be very carefully looked after, as it is also the only article which the soldier may have for covering himself when he is sleeping, and if it gets wet in rain or snow it must be dried as quickly as possible when quarters are reached.

(3) Shirts, drawers, and socks must be washed thoroughly. It is not enough to keep the body free from dirt, as the underclothing accumulates dirt from the body and the wearing of clean underclothing in itself keeps the body clean.

(4) Tears in the drawers must be mended with an even stitch; as otherwise the stitching is apt to cause blistering, especially in the case of mounted men.

(5) The wearing of a flannel belt for the prevention of chill in the bowels is compulsory.

(6) Socks must be changed frequently. Wet socks and socks that have holes in them and are worn out cause blisters and frostbite. If the socks are too worn out to mend and the weather too cold to go without them, then any cloth or flannel that the soldier may have with him should be torn into bandages and wound around the feet.

(7) The boots must be kept soft. Blisters occur not only from badly fitting boots, but also from the hardness of the leather. The boots are kept soft by rubbing grease into the leather.

(8) In order to soften the leather of the military boot the boot should first be soaked in water or brushed with a wet brush. When the leather has become soft from absorbed water it should be dried with a cloth and afterwards smeared with grease and then placed in the sun or near a fire.

(9) The military boot is to the infantryman what the

horse is to the cavalryman. It must therefore be kept as carefully as the horse.

(10) When boots are out of repair the feet are apt to be injured. Great care must therefore be taken to keep the boots in repair and to prevent damage to them. For example, if wet boots are placed before a fire they will suffer damage. To dry boots without damage put dry straw or some woolen material inside them and then hold them before the fire, but at some distance from it.

(11) When boots become worn out during winter and a second pair is not obtainable, tie dry grass or straw that has been thrashed around the uppers, then tie a piece of cloth around this, and wear a sandal with the boot. Raw silk, if procurable, is the best material to wind around the uppers.

3. INSTRUCTIONS REGARDING FOOD AND DRINK.

(1) Food is the source of bodily strength. In war the body is especially in need of strength. Therefore more food must be taken. The results of taking more food are threefold—the soldier marches better, he can stand cold better, and he resists disease better. On the other hand, excess in eating and drinking must be avoided.

(2) When the body is fatigued or hot after exercise it is better to wait a little before eating.

(3) Articles of food that smell or taste badly should not be eaten.

(4) Ripe fruit is useful for quenching the thirst, but it should always be peeled or skinned. Unripe fruit is apt to cause diarrhea, especially when dysentery or cholera are present.

(5) Uncooked food and unboiled water frequently contain the germs of disease and must be avoided.

(6) Although a soldier may have been accustomed previously to drink water from wells, piped supplies, streams, and springs, without boiling it, he must acquire the habit in war of boiling water before drinking it.

(7) Water from old wells, marshes, and surface ponds must never be used, even though boiled, except in case of emergency.

(8) Never consume any food or drink left behind by the enemy.

(9) The drinking of tea, coffee, and similar articles, and the smoking of tobacco are refreshing and useful when fatigued.

(10) Drinking alcohol in moderation is useful in restoring one from fatigue and in giving a sense of well-being, but excess of alcohol must be avoided.

(11) Alcohol must be avoided in cases of frostbite, numbness, sunstroke or heatstroke.

4. INSTRUCTIONS FOR THE LINE OF MARCH.

(1) On the day before a march boots and socks must be examined and the body cleansed by wiping it with a wet cloth. Also, one should eat and drink in moderation and take as much sleep as possible. Frostbite or sunstroke is apt to be caused by lack of sleep.

(2) Before marching sew on buttons and tapes that require it. In winter the fingers may be too cold to do this after the march has commenced.

(3) Before the march has commenced fill the water bottle with water that has been boiled, or with tea.

(4) The pace must be kept as even as possible during a march and a stooping position must be avoided. On going up hill or marching against a wind neither speak nor smoke.

(5) Do not leave the ranks, except for necessary purposes, because you will have to run to catch up with your file, and even this short run adds to the fatigue of the march.

(6) It is bad to drink whenever you feel thirsty, as the more you drink the more thirsty you become. The soldier must therefore restrain himself from acquiring this habit.

(7) If a large quantity of water is taken at one draught when the body is overheated bad effects, even death, are apt to occur. Instead of drinking a large quantity at once, first moisten the lips and mouth, and then drink small quantities at a time.

(8) Swallowing pieces of ice or snow during a march is bad and only creates greater thirst.

(9) During a halt button the collar of the coat and do not

remove the cap so as to let the sun strike direct on the head. Adopt as easy a position as possible.

(10) Do not lie down on damp ground when the body is heated, but select some dry ground or collect some straw, hay, or branches of trees and lie on those.

(11) On halting for the day the first thing to do is to examine the feet and toes. If any redness is apparent anywhere, go at once to the surgeon and get some ointment to rub on the part or some foot powder to sprinkle over it. (The foot powder consists of 87 per cent mica powder, 3 per cent salicylic acid, and 10 per cent starch powder.)

(12) When the half is made the stockings must be examined and flattened out if they are wrinkled. It is a good plan to put the right stocking on the left foot, and vice versa. If they are saturated with perspiration, put on a clean pair.

(13) Wipe the face, neck, feet, and hands with a wet cloth wrung dry. This will help to remove fatigue after the march.

(14) If it is impossible to get drinking water during the march, salted plums may be sucked; not eaten. If you have no salted plums, then it is a good plan to chew stalks of grass or the leaves of nonpoisonous plants; these will cure thirst temporarily.

5. INSTRUCTIONS REGARDING QUARTERS.

1. HOUSES.

(1) The houses in China and Korea have oven beds (khan or ondoru). If the charcoal hibachi (brazier) is placed inside such houses according to the custom in Japan, one is apt to lose one's life by charcoal-gas poisoning.

(2) If the khan is out of order and can not be lighted, an hibachi may be used, but when this is done a part of the window must be left open day and night.

(3) In China and Korea there are innumerable flies, which settle on the food and contaminate it. Care must therefore be taken to protect the food from flies. Bugs are also found everywhere in China and Korea. They prevent sleep, and their bites cause inflammation and disease of the skin. You must therefore get insect powder from the surgeon or take your own measures for protecting yourself.

(4) There are no latrines or urinals in China or Korea. The soldiers occupying houses must therefore make a trench and fill it with earth after using it, in order to prevent flies from settling on the excreta.

2. TENTS AND BIVOUACS.

(1) In fine weather, even during the night, leave two sides of the tent open, in order to allow a constant current of air to pass through it.

(2) Straw, hay, and branches of trees, used as bedding, should be shaken outside and dried in the sun frequently.

(3) When shelter tents are used the open method of combining them should be employed in summer and the closed method in winter. In both cases the spare sheets will be spread on the ground to prevent dampness or to wrap around the legs as a protection against cold.

(4) In winter the feet are the first part of the body that will be affected by the cold when bivouacking. Therefore more than one pair of stockings should be worn, straw or straw rope wound around the boots, and the feet drawn up under the great coat before going to sleep.

(5) When bivouacking in snow, the snow should be cleared from the ground and heaped up so as to make a shelter from the wind. The entrance to the inclosed space must be on the side away from the wind.

(6) Latrine and urinal trenches must be made as noted in connection with houses.

3. INSTRUCTIONS REGARDING DISEASES CAUSED BY MARCHING.

(1) The principal diseases caused by marching are sore feet, frostbite, and sunstroke. Sore feet have already been dealt with, and this chapter will therefore refer to frostbite and sunstroke only.

1. FROSTBITE.

(1) The fingers, toes, ears, and nose are the parts of the body usually attacked by frostbite, as the circulation of the blood is slowest in them. These parts should therefore be smeared before marching with the ointment issued as a protection against frostbite (Tosho-ko). This ointment contains camphor, petrolatum oil, and simple ointment.

(2) Frostbite and numbness occur most frequently when there is lack of food and sleep. Therefore eat and sleep well, as much as time and circumstances permit.

(3) Drinking alcohol gives temporary warmth, but its after effects are to lower the temperature of the body. Therefore alcohol should be avoided if one is going to be exposed to cold.

(4) Frostbite and numbness may be prevented by movement, because the circulation is thereby increased. Therefore, even on sentry duty, keep moving about and do not stand still.

(5) Rubbing is also a means of preventing frostbite, and whenever the ears, nose, fingers, or toes begin to feel numb, which is the first sign of frostbite, begin to rub.

(6) The most useful protection is the wearing of hoods, gloves, and stockings. Therefore mend holes in these at once.

(7) Frostbite is certain to be caused by touching metal with the ungloved or wet hand.

(8) The toes are the most readily attacked because of the wetness of the stockings from perspiration even when marching on dry ground. When marching across rivers or over snow, care must be taken to have the stockings changed at the halt. A well-known general said that the secret of success in fighting was in the protection of the feet. Therefore, take great care of them.

(9) The end of the penis is easily attacked by frostbite, and care must therefore be taken to adjust the dress after micturition. (During the war with China many cases of frostbite with loss of the penis occurred.)

(10) The first symptom of frostbite is cold in the part, then pain, then loss of sensation. These are signs of an attack of frostbite. When any of them are present, it is bad to warm the part before the fire. Rub it instead with a cloth steeped in water and wrung dry. After the part has been well rubbed, dry it well and smear it with the frostbite ointment. If the symptoms continue, the part will become swollen and change color. If this occurs it is dangerous, and the soldier must report at once to the surgeon.

(11) If your file comrade (Sen-yu) falls down unconscious affected by cold, the following steps must be taken while

awaiting the arrival of the surgeon. Warm wraps must not be put over him, and he must be kept away from the fire. Carry him into a room or place without a fire, remove the clothes, and rub hard with a cloth soaked in water or snow and wrung dry. When the limbs are soft, put him into water and gradually warm it until it is hot by the gradual addition of hot water. If there are no vessels for this or not hot water, perform artificial respiration. After he has been treated with the cold water, gradually heated, take him into a room without a fire, place him on a bed, and perform artificial respiration. When consciousness has returned, give him some warm tea and then place him in a warm bed and let him remain quiet.

(12) Snow blindness is likely to occur on the march. To avoid this the soldier must not look down while marching, and he should wear smoked glass goggles or veils.

(13) The hands should not be kept in the pockets when ice is being crossed, but should be free to save a fall in case of slipping.

2. SUNSTROKE.

(1) Sunstroke is caused by the sun's rays, and is one of the most serious accidents during a march in hot weather.

(2) The persons most readily affected are the inexperienced in marching, the physically weak, convalescents from sickness, those who are suffering from fatigue, those who have had little sleep, those who have had insufficient food, those who are suffering from thirst, those who drink too much alcohol, and those who indulge too much in sexual intercourse.

(3) To avoid sunstroke one must therefore look after one's own health and lead a temperate life. The water bottle must be kept filled in case of thirst, food should be taken in moderation, and one must sleep as much as possible. The unit commander is responsible that the halt is made at mid-day. He is also responsible for prolonging the distance between units, reducing the weight carried, and seeing that the chest is kept free from tight clothing and is open to the air.

(4) The first symptoms of sunstroke are as follows: Excessive perspiration, with the sweat streaming from the forehead into the eyes and down the front of the chest; sense of

to the attendants, each passenger was conducted to a room, which a Japanese bath divided. There he was thoroughly bathed in salt water, and after this received a kimona on the far side and then remained in a waiting room till the clothing was finally delivered. The passengers, after dressing, were conveyed to Ujina on small launches. While this disinfection was in progress the trunks and other baggage had been sprayed with carbolic solution. The methods above outlined were of course insufficient to prevent the introduction of contagious diseases in Japan if they had existed in the passengers or if their clothing had been infected, but the authorities of the station stated that if they had any reason to suspect that the passengers' or other articles might be a source of danger they were much more careful to disinfect everything thoroughly.

The exact personnel of the station was not obtainable; it is believed to have been 1 commanding officer, about 25 surgeons; total personnel, including these, a few soldiers, and a great many civilian employees, about 600.

REGULATIONS FOR THE RAILWAY TRANSPORTATION OF CASES OF EPIDEMIC DISEASES.

(Communication Department Injunction No. 38, August 10, 1900.)

1. Previous permission must be obtained for the admission to trains of patients suffering from epidemic diseases.

2. On application being made for such permission the railway station will appoint the train and will also give necessary instructions so that the safety of other passengers may not be endangered.

3. Patients suffering from epidemic diseases shall not be admitted to trains unless they have the proper certificates of transfer given by the appointed officials in accordance with paragraph 9 of "Law for the prevention of epidemics."

4. The patient suffering from an epidemic disease must be attended by at least one nurse or one servant. At the request of the railway station a physician must accompany the patient.

5. Epidemic patients will be placed in a special hired car, with which no communication will be held.

enters the body with the food or drink. The first thing to do, therefore, is to eat or drink nothing which is not cooked. The germ also exists in the bedding and clothing, and in the field on the hands and fingers. Therefore the underclothing must be kept clean and the outer clothing well brushed, and the hands must be washed before eating, if this is possible.

(3) The germs of dysentery and cholera also enter the body in the same way as the germ of enteric fever. Therefore the same precautions must be taken. But unripe fruit is apt to cause dysentery, and must not be eaten when dysentery is prevalent.

(4) Smallpox is still prevalent in China and Korea. Houses occupied by persons suffering from this disease must be avoided, even by those who are well vaccinated.

(5) Plague always enters the body through small cuts or sores. Therefore when this disease is prevalent do not neglect even the smallest cut, and the surgeon should be consulted concerning it. It is very dangerous at such a time to walk with bare feet. Gloves should also be worn. Rats and flies carry the disease germ. Therefore keep them away from food, etc.

(6) Malarial fever is given to men by mosquitoes. Mosquito nets must therefore be used when there is malarial fever.

(7) The venereal diseases are gonorrhea, syphilis, and soft chancre. They are contracted by intercourse with infected women. The prostitutes of China and Korea are full of infection. Therefore avoid them, so that the world may not know your shame nor your children suffer.

(8) There are several infectious diseases of the eye, but the most dangerous is trachoma or Egyptian ophthalmia. Men are attacked by these diseases from using washing basins or towels in common. This practice must, therefore, be avoided when such diseases prevail. But when it is impossible to have separate basins, etc., rinse out the basin several times before using it. Anyone who touches his eye with the discharge of gonorrhea will probably lose his sight.

SANITARY RULES POSTED AT MUKDEN FOR THE INSTRUCTION OF
CHINESE.

[Mukden Military Administration Bureau, April 20, 38th of Meiji
(1905.)]

MEASURES TO BE TAKEN TO PREVENT INFECTIOUS DISEASES.

Plague, dysentery, and other infectious diseases are each caused by its own special infectious element (lit. disease poison). This goes into the human body sometimes directly and sometimes through the medium of drinks or foods. There it multiplies and causes ultimately the special infection. It is therefore necessary to take prior measures to prevent infection. In order that this may be done, attention is called to the following directions, which will be strictly observed and carried into practice without fail:

1. The infectious element is killed sometimes by heat and sometimes by means of a drug. Among many drugs used for the purpose there is none more suitable for such a place as a closet than water containing 10 per cent lime; this to be thrown over the site.

2. One is most liable to be infected when he visits or lives in the same room with a patient suffering from an infectious disease. Therefore it is most important to keep the patient separated in different quarters from other individuals.

3. As the sputum and matter vomited or purged by the patient contains the infectious element, they should be carefully collected into pails or similar vessels, so as to prevent their being scattered, and then disinfected with lime.

4. Also, as the bedding, clothes, utensils, etc., used by the patient have the infectious element attached to them, it is best to burn them. But in case this can not be done, they should be put into a kettle and well boiled.

5. In regard to the dead body of the patient, it is best disposed of by cremation, but in the event of this method being impracticable, the body shall be buried deep (10 feet) in the ground without delay, and shall never be left for long in a room or in a place outside the town.

6. In order to get sunshine and fresh air into rooms, the windows shall be opened from time to time. Rooms shall

be kept dry. The method taken to accomplish this purpose is immaterial. Sunshine and the absence of moisture are very efficacious in killing the infectious element.

7. Refuse shall be burned and the purged matter collected in pails shall be disposed of at a place far out of town.

8. The infectious element may be present in water. Therefore water shall be well boiled before it is used for drinking. It is dangerous to drink unboiled water.

9. Raw articles should never be eaten. They shall be boiled or cooked before they are used for food, and if so prepared they shall not be eaten when they have stood for a long time thereafter and show any signs of putrefaction.

10. However well food is once cooked, there is much danger of it becoming infected if it stand for a long time. In summer flies are the medium by which the infectious element is carried. Therefore food and drink shall, without fail, be kept in covered vessels, to prevent flies from swarming on them.

REGULATION OF PROSTITUTION BY THE JAPANESE AT MUKDEN.

By the 1st of May, 1905, the Japanese military administrator in the city of Mukden had licensed 60 Chinese women as prostitutes. He stated that great care was taken that these women were not forced into this life, but entered it willingly, and also that they were not illtreated by their masters. The women are examined biweekly by surgeons specially detailed. Each is given a wooden tag, which is her permit, and if she is found diseased this is taken from her by a gendarme at the door of the examination room, and she is sent to the hospital, where she is treated until well by a Japanese medical officer. One captain, 1 lieutenant, 1 male nurse, and 1 woman nurse are on this duty. No instruments for the proper care of these cases were on hand, but they were asked for by telegraph from Japan. The women are given instructions, which tell the regulations in simple language. Posted inside the doors of the houses are the instructions for the soldiers. The latter are informed that they should have nothing to do with women without the wooden tag. The hours are stated to be

from 9 a. m. till 12 midnight. They are directed to bring no wine to the house; that they must pay the women, and should not cohabit with them if they are themselves diseased. These houses are only intended for Japanese soldiers, but it is intended later to inspect prostitutes for Chinese. The houses referred to are all in one district, which is marked by red flags. The surgeon stated that his examination of these women was a very thorough one, including the genitals, the throat, and the skin.

Statement of patients received, with their diseases, at Hospital No. 4 (contagious disease hospital), Hiroshima, from July 12, 1904, to September 15, 1905.

Total number of
patients received 6,629
Number died----- 762

Dysentery ----- 2,191
Died ----- 224

Typhoid fever---- 1,567
Died ----- 299

Most of these patients came from Port Arthur, but others were received from different points in Manchuria. The different types of dysentery are not separated in the records, but in general terms it may be said that the amœbic came from Manchuria and the specific from Hiroshima. Both the organisms of Shiga and Flexner have been found. The director believes that bacilli may perhaps be found in Manchuria, but when patients are received from there only the amœba can be discovered. There have been but 6 or 7 cases of abscess of the liver. This is not nearly as large a proportion as in the dysentery cases among French soldiers who were cared for in Hiroshima during the North China war. Then 120 cases of dysentery gave about 4 of abscess of the liver. These were all said to be in men over 30. The director believes that abscess of the liver is more common in older men, and states that this is the case in the Japanese army in Formosa. He also believes the use of alcoholic liquors in excess to be a predisposing cause. The treatment has been: Diet—soup, milk, eggs, etc.; and drugs—bismuth, tannin, large irrigations of boracic acid; silver nitrate is used rarely in selected cases, but quinine is never employed. The principal reliance is placed in thorough irrigation and good food. Early in the disease magnesium sulphate is given, but not ipecacuanha. The high death rate is ascribed to the fact that most of the cases have beriberi, and in consequence bad hearts. Amœbic dysentery is rare in Japan, but specific is common, about 30 cases being found at all times in the civil hospital at Hiroshima during the season of prevalence, which is from early summer to autumn.

A few of these were paratyphoid, and an organism was found the exact nature of which is unknown. About 30 of these cases were, perhaps, typhus. Some did not and some did give the Vidal reaction. In the cases diagnosed as typhoid, but thought possibly typhus, the typhoid bacillus could not be found in the blood by puncture of the spleen; only two of these cases died; on post-mortem in one nothing was found in the intestines. Typhus is almost unknown in Japan, while typhoid is not uncommon. The high death rate here is ascribed to the same cause as in dysentery.

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Statement of patients received, with their diseases, at Hospital No. 4 (contagious disease hospital), Hiroshima, from July 12, 1904, to September 15, 1905—Continued.

Smallpox -----	16	One case may have been a second attack. All have been vaccinated, but probably unsuccessfully.
Died -----	1	
Tuberculosis -----	1,024	Most cases of this disease were sent to divisions, only those being retained whom it was impossible to send. Tuberculosis is a common disease in Japan.
Died -----	101	
Scarlet fever -----	3	This is a very common disease with children in Japan; so common that the director does not believe that there are enough adults at the age of soldiers who have not had the disease to make it of much importance in the Japanese army.
Died -----	0	
Measles -----	72	
Died -----	0	
Recurrent fever -----	3	
Died -----	0	
Erysipelas -----	116	Very few cases except with visible wounds, usually of the head. Wounds were probably the cause of death in all cases.
Died -----	8	
Tetanus -----	60	All from wounds, mostly from Port Arthur, but tetanic symptoms did not appear until they reached Hiroshima. The director thinks that wounds caused by hand grenades in tunnels were especially likely to become infected. The disease is a very rare one in Japan.
Died -----	36	
Leprosy -----	58	All these cases were either sent to their divisions or discharged. Leprosy is fairly well confined to certain districts in Japan, being most prevalent in the vicinity of Hiroshima, Kusu, Kumamoto, and at a place about 30 miles from Tokyo.
Died -----	0	
Cerebro-spinal meningitis -----	68	This disease is very rare in Japan, but about one-half the cases came from Hiroshima. It is stated that in the majority of those who recovered the cure was complete, except two were deaf, one had contractures of muscles, and one was insane.
Died -----	14	
Other cases, mostly influenza, one diphtheria -----	182	
Died -----	2	
Convalescents -----	1,264	These were patients who had suffered from contagious diseases, but who had recovered from them when they reached the hospital, still being ill with beriberi or weak.
Died -----	147	
Not accounted for -----	65	

NOTE.—When possible, contagious cases in the acute and communicable stage are all retained in Manchuria, but when there is not time to care for them there they are sent home. Almost all patients, except those of the Sixth and Twelfth Districts, who go to Moji come to Hiroshima.

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Record of contagious diseases in the Second Army by ten-day periods from January 1, 1905, to April 30, 1905.

Disease.	January, 10-day periods.			February, 10-day periods.			March, 10-day periods.			April, 10-day periods.		
	First.	Second.	Third.	First.	Second.	Third.	First.	Second.	Third.	First.	Second.	Third.
Typhoid.....	5	4	4	1	0	0	1	3	16	20	29	21
Dysentery.....	0	0	0	0	0	1	0	0	0	0	1	0
Erysipelas.....	10	10	0	0	12	0	36	58	80	17	82	63
Scarlet.....	0	0	0	0	0	0	0	0	0	0	0	0
Cholera.....	0	0	0	0	0	0	0	0	0	0	0	0
Other infectious diseases.....	0	0	4	2	2	0	0	0	0	1	0	9

The cases noted here do not include all cases in the Second Army, as with the rapid methods pursued by the Japanese for the transfer of patients to hospitals it was not always practicable to make a definite diagnosis at the time of the transfer.

STATEMENT IN REFERENCE TO TYPHOID FEVER CASES TREATED AT TOKYO IN 1904.

Typhoid fever cases received from the front: Twenty soldiers, 1 military employee. Of these 2 recovered, 4 died, 2 were returned to their homes, and 13 were still under treatment, January 1, 1905

Typhoid fever cases received from home troops: Fifty-three soldiers, 15 military employees. Of these 16 recovered, 14 died, 2 returned home, and 36 were still under treatment, January 1, 1905.

Number of days lost by men from the front, 570; number of days lost by those from home, 2,252.

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Record of temperatures in Manchuria from January 1, 1905, to July 7, 1905.

[From January 1 to February 26 the temperatures were taken at Shihliho; from the latter date till March 11 at the headquarters of the Second Army; from March 11 to May 10 at Mukden, and after that date in the vicinity of Ching ung pu.]

Date.	Maxi- mum.	Mini- mum.	Date.	Maxi- mum.	Mini- mum.	Date.	Maxi- mum.	Mini- mum.	Date.	Maxi- mum.	Mini- mum.
	°F.	°F.		°F.	°F.		°F.	°F.		°F.	°F.
Jan. 1	41	9	Feb. 26	37	14	Apr. 12	51	35	May 27	61	51
2	42	25	27	37	0	13	53	36	28	70	50
3	41	20	28	33	6	14	49	36	29	81	57
4	46	28	Mar. 1	39	10	15	52	33	30	75	60
5	33	10	2	42	10	16	52	36	31	76	53
6	45	18	3	34	12	17	52	36	June 1	80	57
7	39	15	4	36	9	18	52	38	2	79	67
8	45	13	5	34	7	19	51	37	3	72	51
9	40	18	6	36	9	20	45	34	4	84	60
10	45	10	7	41	14	21	55	33	5	79	43
11	51	13	8	46	18	22	59	32	6	81	54
12	43	21	9	48	17	23	63	38	7	75	53
13	41	25	10	46	21	24	62	49	8	83	64
14	30	15	11	46	17	25	62	41	9	83	54
15	42	12	12	50	16	26	70	45	10	84	63
27	14	2	13	51	18	27	63	52	11	77	66
28	18	— 2	14	31	13	28	68	48	12	77	62
29	18	— 6	15	30	10	29	70	48	13	77	63
30	11	— 10	16	33	13	30	63	49	14	77	64
Feb. 31	17	— 5	17	49	14	May 1	62	44	15	84	64
1	20	— 5	18	48	23	2	62	45	16	88	64
2	18	— 14	19	50	19	3	63	45	17	95	68
3	18	— 6	20	55	20	4	64	46	18	93	72
4	19	— 4	21	59	37	5	63	54	19	85	71
5	20	— 6	22	60	33	6	64	52	20	81	72
6	21	— 2	23	61	32	7	71	54	21	79	69
7	19	0	24	60	34	8	77	56	22	81	66
8	22	— 8	25	64	35	9	77	59	23	83	66
9	11	— 10	26	64	40	10	73	52	24	86	67
10	19	0	27	57	37	11	84	41	25	74	66
11	28	4	28	52	34	12	85	67	26	82	67
12	31	3	29	39	28	13	76	63	27	81	69
13	33	6	30	37	31	14	67	58	28	74	64
14	33	8	31	38	32	15	72	54	29	78	62
15	34	10	Apr. 1	44	42	16	68	57	30	77	66
16	34	5	2	48	39	17	70	54	July 1	79	65
17	30	2	3	50	36	18	70	52	2	81	68
18	28	— 2	4	54	32	19	70	51	3	77	69
19	32	14	5	52	34	20	68	45	4	82	68
20	26	13	6	48	33	21	71	46	5	87	73
21	20	0	7	50	32	22	66	43	6	90	77
22	23	— 4	8	59	39	23	70	52	7	87	77
23	29	5	9	64	36	24	72	47			
24	28	1	10	63	41	25	72	50			
25	43	9	11	61	35	26	67	50			

Report on the effects of cold on the Japanese soldiers during the battle of Heikoutai (Chentanpu), January 25 to 29, 1905.

(Obtained from surgeon-general Second Imperial Japanese Army.)

WEATHER DURING THE BATTLE.

On the 23d of January there was a sudden change in the weather. The temperature fell to a very low point, the relative humidity increased, and the wind began to blow from the north. On the 26th snow began to fall, and the

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weather was at its worst on the 27th, 28th and 29th. The air was then saturated with moisture, and this high relative humidity caused it to become a good conductor of heat from the body. To this fact, more than to the actual lowness of the temperature, are to be attributed the effects of the cold. The following table is a record of the weather during the battle:

	Jan. 26.	Jan. 27.	Jan. 28.	Jan. 29.	Jan. 30.	Jan. 31.
Weather.....	Snow.	Snow.	Snow.	Cloudy.	Fine.	Fine.
Cloud.....	10	10	10	7	0	0
Wind direction..	NE.	N.	SE.	N.	S.	N.
Wind force.....	Light.	Moderate.	Light.	Moderate.	Light.	Moderate.

TEMPERATURE, CENTIGRADE.

6 a. m.....	-13	-20	-19	-24	-23	-21
2 p. m.....	-8	-9	-10	-11.5	-11	-6
10 p. m.....	-17	-12	-19	-17.5	-19	-11

Remarks.—From the 26th to the 29th the air was saturated with moisture. On the 30th and 31st, it was somewhat dryer.

LOCAL EFFECTS OF THE COLD AND SNOW ON THE BODY.

There were two kinds of local effects. The first was freezing of the extremities, and the second was certain local effects on the eyes. The local effects, other than affection of the eye, were those of frostbite. Most occurred between the 26th and 29th, during the days of the fighting, but there were a few cases after the fighting ceased. The majority of the cases occurred on the 29th, the next greatest number on the 27th; a fact that shows the relationship between the fighting and frostbite. It was on those days that the fighting was most severe and the weather at its worst. About 300 cases of frostbite were admitted into hospital between the 26th and 29th. There were only two officers among them.

The cases of frostbite in the regiment which suffered most were as follows: On the 27th, 13; on the 28th, 156; on the 29th, 169; on the 30th, 7; and on the 31st, 4. Many of these cases did not go into hospital.

Most of the frostbites were mild cases of the first or second degree—that is to say, cases with simple redness and

swelling and cases with deep red or purple swelling and blistering. Cases of the third degree—that is, gangrene—were rare. Ninety-seven of the cases admitted to hospital were discharged, cured, within a week. Out of 113 cases observed in the field hospitals at Tatai and Hsieotientzu, most had a history of being frostbitten at night. Very few suffered frostbite during the day. The feet were affected more than the hands and the hands more than the other extremities. In the foot cases the great toe was affected most often, then the little toe, and then the heel. In the hand cases, on the other hand, the thumb was the least frequently affected. The middle and ring fingers were the fingers which suffered most often and then the index and little finger. Omitting one case of frostbite of the ear, the following is an analysis of the remaining 112 cases observed in the two field hospitals: Those affected during the day were 10 foot cases, of which 2 were left foot only and 8 both feet; 6 hand cases, of which 1 was left hand only and 5 both hands. The total day cases were thus 16. Of the night cases, 69 were foot cases, of which 7 were left foot, 13 right foot, and 49 both feet; 27 were hand cases, of which 2 were left hand, 8 right hand, and 17 both hands, a total of 96. Of these cases 47 were affected in the second degree and the rest in the first degree only. There were no cases of the third degree.

The predisposing causes of frostbite were:

(1) Wet feet: The melting snow penetrated through the stitching of the welts of the boots, and one could see the line of wet along the socks. The officers seldom had wet feet, as their boots were of better quality. Some surgeons attributed the wet feet to perspiration, but this is incorrect.

(2) The leather of the boots became very hard and frozen, pinching the feet and interfering with the circulation.

(3) The fighting took place often during the night, and the men were obliged to lie on the snow in fixed positions. They were unable to move about in order to maintain circulation, and the gloves got wet in the snow.

(4) The men went to sleep unconsciously; they were worn out with fatigue, want of sleep, and want of food.

(5) The country was an open plain without cover, and the enemy close up to the men. This often prevented them from

lighting camp fires. The wounded suffered very little. Only 25 cases occurred among them.

The experience of the Heikoutai fight led to certain measures being taken to prevent frostbites during the Mukden battle. These measures were:

- (1) Boots were well greased, especially along the welts.
- (2) The men were given more than one pair of socks and gloves, so that they might have a change, should the socks or gloves become wet.
- (3) Whenever there was a halt for a long time, the men were made to take off their boots and put on Chinese felt or straw shoes.
- (4) Each soldier was given an issue of sugar, which he carried in his pocket, and which he was told to eat as he lay in his position. This not only kept him awake, but it increased the bodily warmth by combustion.

3. EFFECTS ON THE EYE.

Snow blindness and conjunctivitis did not occur. These conditions are usual results of exposure to reflected light from a snow surface, and their absence is due to the fact that the snowy days were cloudy and that the soldiers were provided with goggles of dark cloth.

A few cases of night blindness occurred in the artillery regiment and a few cases amongst infantry, but these were most probably due to the heavy work that had to be done at night in making gun positions, etc.

4. GENERAL EFFECTS OF COLD.

No cases of death or apparent death from extreme cold occurred. This good result must be attributed to the excellence of the clothing.

5. EFFECTS OF COLD ON THE WOUNDED.

In warm weather it is customary to remove the clothing in order to dress a wound at the temporary dressing stations and on the firing line. On this occasion the clothing was never removed until the patients reached the hospital. In-

stead, a piece of the clothing was cut away from over the wound and the wound quickly dressed and the patient at once taken to the field hospital.

6. DISEASES ATTRIBUTED TO THE COLD.

Rheumatic pains from cold have been extremely rare, but since the beginning of February—that is, after the battle was over—there was a mild outbreak of a catarrhal condition like influenza. The symptoms were laryngitis, pharyngitis, gastric catarrh, neuralgia, and a temperature rising to 38° C. The cases remained with the regiment and recovered in a week.

7. EFFECTS OF COLD ON FOOD.

The chief effect of cold on food was that the cooked rice, carried by the soldier in the rice basket, froze solid and could not be eaten until it thawed. This could not always be effected. Some soldiers carried their rice baskets under their waistcoats, but this was inconvenient when they had to get into firing position. Some made a soup of the cooked rice by pouring water over it and heating it over a fire, but this required nearly thirty minutes in preparation, as it took a long time to thaw the rice. The result was that, after the first day's experience, the soldiers carried the rice uncooked, as they found that they could make a rice broth of the uncooked rice in twenty minutes instead of thirty. In consequence of the difficulty in keeping the rice ration from freezing, half the ration was replaced by biscuit. But this made the men very thirsty, and moreover it took a much longer time to eat. The result was that even the heaviest eaters did not eat all their ration, and the men were consequently hungry. The water bottles also were not suitable for use in extreme cold, as the water froze in them at once.

8. EFFECTS OF COLD ON MEDICAL AND SURGICAL MATÉRIEL.

Most of the drugs in solution froze, but the glycerine, alcoholic solutions, and the tinctures remained fluid.

The most important drugs used in the firing line, namely, liquor camphoræ and liquor morphiæ were not so affected

as to make it impossible or difficult to use them. The former became of the consistency of condensed milk but became fluid again with the warmth of the hand; the latter was not affected at all. Esmarch's elastic tourniquet also remained unaffected, as it was not exposed to the cold, in consequence of the manner in which it was carried by the men of the medical corps, namely, round the waist or over the shoulder under the coat.

NOTE.—The statement here made in reference to the relative immunity of wounded to frostbite accords neither with every other opinion expressed nor with personal experience.

Statement in reference to frostbite, received from second army headquarters.

The following statements in reference to frostbite were received from Second Army headquarters in connection with lectures delivered on the battle of Heikoutai: It was found very necessary at that battle to provide hot food in order to prevent frostbite. Heavy baggage was often brought to the front so that this might be done, and fires were made in the face of the enemy. The Second Army is said not to have suffered so very severely from frostbite to Heikoutai, though the cold was extreme; it is stated that this army had but 500 cases, mostly in wounded, whom it was decidedly difficult to rescue, as the medical personnel was short handed and the shell fire was heavy.

The following rules to prevent frostbite were formulated from the experience at Heikoutai: 1. Carry spare boots to replace others when wet. Chinese boots with grass were found good but the big straw boots were better. 2. Stockings and gloves must be heavy. 3. Stomach must be filled; soldiers were allowed to eat at any time at the fight in question. 4. Sleep; tried to allow men to sleep in daytime, but there was nothing to cover them, so had two men, one awake rubbing the other's hands and feet while he slept. 5. Constant motion; not good to sweat. 6. Collected as much kaoliang as possible so that could lie down and be protected from the snow surface.

Experiments made in the prevention of certain diseases by the habitual use of creosote, etc.

The experimental work given below is hardly of such a character as to prove conclusively the value of creosote in preventing certain diseases, and it is thought probable that the Japanese must have made other experiments in this line; nothing more could be found, however. Those described here are taken from a translation of an article published in a Japanese medical journal:

“Creosote is believed to be effective in preventing multiplication of organisms and so disease. Experiment has shown that if healthy persons take creosote regularly they are better able to combat the germs of disease; that, even if organisms are ingested, when creosote is taken they will not multiply, but will die.”

EXPERIMENTS, APRIL 18, 1904.

First test: To find if healthy men have more resistance against certain diseases while using a certain amount of creosote each day.

Second test: After healthy men have taken creosote for a sufficient length of time to get its full beneficial effect, how long will they retain their power of resistance?

Third test: Test of the power of resistance against bacteria by use of creosote made from carbolic acid, and of magnesium sulphate and carbolic acid creosote.

Fourth test: Experiments on animals, by giving a certain amount of creosote each day, and then by introducing bacteria into digestive organs.

Healthy men were chosen and each day were given creosote, as follows: Three times daily one pill, total amount daily 30 centigrams, one man for a week, one for a month; three times daily one pill, carbolic acid creosote, total amount 30 centigrams daily to one person for one month; carbolic acid creosote, mixed with magnesium sulphate, one person for one month.

Animals: Two rabbits and two marmots; creosote given depending upon body weight, total quantity daily from 3 centigrams to 10 centigrams. Soup and creosote were mixed

in equal parts, and water was added to this. The mixture was injected into the mouth, and the animals were forced to drink it during a period of from ten to thirty days.

With the men each day discharges from the bowel were taken and mixed and shaken with 300 grams of bouillon, and an attempt was made to obtain cultures. The duration of the examinations for growth was forty-eight hours. After the use of creosote had been stopped for a certain time the same experiment was made. These experiments have been carried on for four months, but in reality no single result is based on an experience of more than two months and eighteen days. Experiments with animals have not been completed and will not be further discussed.

The conclusions reached were as follows: With the colon bacillus in a man using creosote for one week the resistance was remarkably increased; five days after stopping the power of resistance remained the same, but diminished gradually, until at the end of three weeks it was normal only. With typhoid about the same results were obtained.

Taken for a month the power of resistance was remarkably increased till the end of one week, and then slightly till the beginning of the fourth week, when it again began to increase; after stopping, at the end of three days a small decrease in resistance was noted, and at the end of forty days it had almost entirely disappeared.

With carbolic-acid creosote for one month, after a week resistance increased; after thirty days again an increase; after three days' stoppage, less, and then stayed the same for three weeks.

With carbolic-acid creosote and magnesium sulphate for one month the test was a failure.

The ultimate conclusions were as follows: "The effect of carbolic-acid creosote is less than beech-wood creosote; the continuance of the power of beech-wood creosote is somewhat less in time than the period it has been taken. As carbolic-acid creosote is absorbed, it can not be absolutely denied that it may act as a general antiseptic."

(Signed)

KUNITA AND TOTSUKA.

APPENDIX VI.

STATISTICS.

JAPANESE CASUALTIES DURING THE RUSSO-JAPANESE WAR.

Official Japanese statement to include the entire war.

Killed in battle	47,387
Died of wounds	11,500
Wounded, but recovered.....	161,925
Total killed and wounded.....	220,812
Died of sickness	27,158
Sick, but recovered	209,065
Total sick	236,223
Total of killed, wounded, and sick.....	457,035
Total of fatal casualties.....	86,045

These figures relate to the field only, not including cases among the troops in Japan or Formosa, and they may be slightly altered when all the reports of hospitals are compiled. Of those who succumbed to disease nearly three-fourths died in the field and one-fourth after reaching home.

To find the total number of killed in battle and patients treated the following additions must be made:

Total of killed, wounded, and sick in the field.....	457,035
Patients treated at home.....	97,850
Russian prisoner patients	77,803
Grand total	632,688

The above figures do not include slight cases remaining with the Japanese regiments. In April, 1906, when these figures were published, the Japanese missing had been reduced to 3,000.

400 MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR.

Comparative statement of the results of treatment, by wars.

	Sick and wounded treated in hospital.		Wounded treated in hospital.	
	Recovered completely.	Died.	Recovered completely.	Died.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
Chinese-Japanese war.....	50.94	14.24	68.23	7.49
Russo-Japanese war.....	54.81	7.65	71.58	6.83

The difference between each of the totals and 100 represents men incapacitated for active service.

Comparative statement of cases and deaths from sickness and wounds, by wars.

	Wounded.	Sick.	Died of Wounds.	Died of Disease.
Chinese-Japanese.....	1	6.98	1	12.09
North China.....	1	4.37	1	1.97
Russo-Japanese.....	1	1.07	1	0.46

Comparative statement of percentage of sickness in total number of troops in the field, by war.

	Percentage of sickness for all troops engaged.	Percentage of deaths from sickness for all troops engaged.
Chinese-Japanese.....	59.20	9.29
North China war.....	31.88	4.33
Russo-Japanese.....	36.04	2.99

The average monthly percentage of sickness during the twenty-one months of the Russo-Japanese war was 8.69, while the average monthly percentage for 1902, which is said to have had an exceptionally good medical record, was 10.21.

In the Chinese-Japanese war cases of contagious diseases comprised 14 per cent of the total number of patients, while in the recent war such cases occurred in but 3.7 per cent of patients. In the former war 4.21 per cent of all sickness resulted from frostbites, and in the latter 0.35 per cent. The improvement noted in the Russo-Japanese war in beriberi was not great, however. In peace only 0.44 per cent of the army is afflicted with this disease; in the Chinese-Japanese war 18 per cent suffered from it, and in the Russo-Japanese war 16 per cent.

MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR. 401

Sickness classified by disease, troops at the front, First Army.

Month.	New cases.	Noncon- tagious.	Contagious.			Percentage.		
			Dysen- tery.	Typhoid fever.	Kakke.	Noncon- tagious.	Typhoid fever.	Kakke.
1904.								
March.....	3,829	3,804	3	0	22	99.35	0.08	0.58
April.....	3,622	3,545	20	1	56	98.15	.03	1.55
May.....	3,243	3,154	10	19	54	97.35	.59	1.67
June.....	4,992	4,824	31	9	128	96.65	.18	2.56
July.....	5,849	5,565	29	4	251	95.14	.07	4.29
August.....	6,762	6,006	10	9	737	88.94	.13	10.09
September.....	6,279	5,416	2	2	859	86.26	.03	13.68
October.....	5,047	4,346	.....	11	690	88.31	.20	11.49
November.....	7,533	5,622	.....	19	1,892	74.63	.25	25.37
December.....	8,236	5,440	.....	7	2,789	66.06	.08	33.86
1905.								
January.....	4,596	3,329	.....	2	1,265	72.44	.04	27.52
February.....	3,266	2,707	.....	18	541	82.89	.55	16.56
March.....	4,753	4,206	.....	7	540	88.49	.15	11.36
April.....	3,754	3,463	.....	21	270	92.27	.56	7.17
May.....	3,854	3,551	.....	21	282	92.14	.54	7.32
June.....	2,410	2,289	.....	6	115	94.98	.25	4.77
July.....	2,228	2,129	.....	2	97	95.55	.09	4.36
Total...	80,253	69,396	111	158	10,588	86.47	.20	13.19

NOTE.—“New cases” represent the total number of patients taken sick with regiments, etc. It is quite possible that diagnoses were altered in many cases after such patients reached hospitals, as the Japanese transfer sick to hospitals from their organizations so promptly that there is hardly time for great accuracy in diagnosing their complaints at the latter.

It is believed that at least through May, 1905, the First Army consisted of its three original divisions; before that time the figures are therefore fairly comparable month by month.

Special attention is drawn to the figures for dysentery; a different method of classification was adopted for this disease after August, 1904; before that time all cases of dysentery discovered were entered, but after it only cases of specific dysentery were classified.

Sickness classified by disease, troops on the line of communication, First Army.

Month.	New cases.	Noncon- tagious.	Contagious.			Percentage.		
			Dysen- tery.	Typhoid fever.	Kakke.	Noncon- tagious.	Typhoid fever.	Kakke.
1904.								
March.....	924	748	3	0	9	79.08	.....	0.99
April.....	3,341	2,627	98	3	52	78.93	0.09	1.56
May.....	5,061	4,213	143	3	100	83.01	.06	1.11
June.....	5,494	4,458	189	12	207	81.11	.22	3.78
July.....	9,720	8,324	115	25	649	83.64	.25	6.64
August.....	.....	9,282	214	16	1,844	.....	.....	.....
Total.....	.....	29,652	762	59	2,861	.....	.....	.....

NOTE.—“New cases” represent the total number of patients taken sick with regiments, etc. It is quite possible that diagnoses were altered in many cases after such patients reached hospitals, as the Japanese transfer sick to hospitals from their organizations so promptly that there is hardly time for great accuracy in diagnosing their complaints at the latter.

The figures for dysentery represent the different varieties of that disease.

In both these tables “New cases” include all men excused from any part of their military duty because of illness.

402 MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR.

Patients classified according to disposition, troops at the front, First Army.

Month.	New cases.	Recovered.	Died.	Sent to rear.
1904.				
November.....	7,533	2,990	4	2,571
December.....	8,236	4,575	6	2,325
1905.				
January.....	4,596	1,947	7	1,398
February.....	3,266	2,280	3	1,098
March.....	4,753	2,857	5	1,435
April.....	3,754	2,174	3	947
May.....	3,854	2,533	7	1,012
June.....	2,410	1,850	3	579
July.....	2,228	1,684	2	569
Total.....	40,630	23,160	40	11,895

NOTE.—It should be remembered that the figures for new cases represent all those taken sick with regiments; the number of deaths is naturally very small, as the Japanese transfer patients to hospitals as quickly as possible.

The figures under "sent to rear" represent the number of patients sent to hospitals, about one-fourth of whom recover at the front, a certain number in hospitals on the lines of communication, and the remainder are sent to Japan.

It is believed that at least through May, 1905, the First Army consisted of its three original divisions; before that time the figures are therefore fairly comparable month by month.

Wounded classified according to kind of wound, First Army.

GUARDS DIVISION.

Name of battle.	Bullet wound.	Shell wound.	Bayonet wound.	Total number of wounded.	Percentage.		
					Bullet wound.	Shell wound.	Bayonet wound.
Yalu.....	127	19	0	146	86.99	13.01	0
Yoshirei.....	366	46	1	413	88.62	11.14	0.24
Liaoyang.....	1,953	225	0	2,178	89.67	10.33	0
Total.....	2,446	290	1	2,737			

SECOND DIVISION.

Yalu.....	288	64	0	352	81.82	18.18	0
Motienling.....	280	4	1	285	98.25	1.40	0.35
Yoshirei.....	94	10	4	108	87.04	9.26	3.70
Liaoyang:							
Sashiko.....	478	3	45	526	90.89	.57	8.54
Sanchiasai.....	93	2	0	95	97.90	2.10	0
Heiyental.....	737	a 146	11	914	80.63	15.98	1.20
Total.....	1,970	249	61	2,280			

TWELFTH DIVISION.

Yalu.....	356	15	4	375	95.70	4.03	1.06
Hsihoyen.....	359	140	15	514	69.84	27.24	2.92
Yushullingtzu.....	353	53	0	406	86.52	12.99	0
Liaoyang:							
Left bank of Taitzu.....	561	b 174	10	745	75.71	8.91	1.35
Right bank of Taitzu.....	705	179	48	932	75.64	19.21	5.15
Total.....	2,334	561	77	2,972			

a Includes 20 dynamite wounds. b Including 108 wounds caused by thrown stones.

Entire First Army.

Name of battle.	Bullet wound.	Shell wound.	Bayonet and sword wounds.	Explosives, stones, etc.	Total.	Percentage.			
						Bullet wound.	Shell wound.	Bayonet and sword wounds.	Explosives, stones, etc.
Sha River.....	6,040	966	59	236	7,301	82.73	13.23	0.81	3.23
Mukden.....	7,875	1,494	45	96	9,510	82.81	15.17	.47	1.01
Total..	13,915	2,460	104	332	16,811	.....	.....	.....	.....

NOTE.—The total for the Sha includes 519 killed and that for Mukden 898 killed.

Wounded classified according to severity of wound, First Army.

GUARDS DIVISION.

Name of battle.	Severe.	Slight.	Very slight.	Total.	Percentages.		
					Severe.	Slight.	Very slight.
Yalu.....	45	99	4	148	30.41	66.89	2.70
Yoshirei.....	125	260	28	413	30.77	62.95	6.78
Liaoyang.....	783	1,255	142	2,180	37.85	57.62	6.53
Total.....	953	1,614	174	2,741	.....	.....	.....

SECOND DIVISION.

Yalu.....	195	153	4	352	55.40	43.47	1.13
Motienling.....	159	126	4	289	55.02	43.60	1.38
Yoshirei.....	47	60	1	108	43.52	55.56	.92
Liaoyang:							
Sashiko.....	214	306	7	527	40.61	58.06	1.33
Sanchiasai.....	36	57	2	95	37.90	60.00	2.10
Helyental.....	284	622	8	914	31.07	68.05	.88
Total.....	935	1,324	26	2,285	.....	.....	.....

TWELFTH DIVISION.

Yalu.....	148	157	67	372	39.79	42.20	18.01
Hohoyen.....	185	267	62	514	36.00	51.94	12.06
Yushulingtsu.....	153	206	49	408	37.00	50.49	12.01
Liaoyang:							
Left bank of Taitzu.....	309	315	117	741	41.70	42.51	15.24
Right bank of Taitzu.....	403	370	137	910	40.65	44.62	14.73
Total.....	1,198	1,315	432	2,945	.....	.....	.....

ENTIRE FIRST ARMY.

Sha River.....	2,231	3,787	764	6,782	32.90	55.83	11.27
Mukden.....	2,167	5,460	985	8,612	25.16	63.40	11.44
Total.....	4,398	9,247	1,749	15,394	28.57	60.07	11.36
Grand total.....	7,484	13,500	2,381	23,365	32.03	53.50	14.47

404 MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR.

Number of wounded cared for in field hospitals, First Army.

GUARDS DIVISION.

Name of battle.	Total number of wounded.	Number of field hospitals opened.	Average number of patients.	Remarks.
Yalu.....	354	2	177	225 Russians.
Yoshirei.....	405	3.5	115.7	4 Russians.
Liaoyang.....	2,348	5.5	426.9	9 Russians.
Sha River.....	2,856	4	714	
Mukden.....	2,338	3	797	

SECOND DIVISION.

Yalu.....	254	1	254	111 Russians.
Motienling.....	239	1.5	159	9 Russians.
Yoshirei.....	118	1	118	
Liaoyang:				
Sashiko.....	543	1.5	362	29 Russians.
Sanchiasai.....	119	1	119	
Heiyental.....	847	2	424	3 Russians.
Sha River.....	3,162	4	790	
Mukden.....	4,797	6	799	

TWELFTH DIVISION.

Yalu.....	365	2.5	142.4	
Hsihoyen.....	460	2	230	
Yushulingtzu.....	467	2	233	
Liaoyang:				
On the left bank of Taitzu.....	548	2	274	
Right bank of Taitzu.....	741	3	247	
Sha River.....	1,686	2	843	
Mukden.....	2,350	3.5	671	

NOTE.—In the Twelfth Division 305 Russians are included among those treated in the field hospitals.

It is noted by the Japanese authorities furnishing the tables for the Shahe and Mukden that some Japanese patients and Russian wounded and sick are included in these tables.

Number of killed, First Army.

GUARDS DIVISION.

Yalu.....	27
Yoshirei.....	79
Liaoyang.....	333
Sha River.....	361
Mukden.....	564
Total.....	1,364

SECOND DIVISION.

Yalu.....	94
Motienling.....	72
Yoshirei.....	16
Liaoyang:	
Sashiko.....	160
Sanchiasai.....	10
Heiyental.....	227

MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR. 405

Sha River.....	560
Mukden	1, 025
Total	2, 161

TWELFTH DIVISION.

Yalu	73
Hsihoyen	60
Yushulingtzu	62
Liaoyang:	
Left bank, Taitzu.....	152
Right bank, Taitzu.....	162
Sha River.....	308
Mukden	335
Total	1, 161
Grand total.....	4, 689

Sickness for three divisions at the front, Second Army.

Month.	New cases.	Contagious.		Kakke.	Percentages.	
		Dysen-tery.	Typhoid fever.		Typhoid fever.	Kakke.
1904.						
May.....	1,384					
June.....	2,822					
July.....	5,615					
August.....	7,129					
September.....	6,771					
October.....	4,694					
November.....	5,138					
December.....	4,068					
1905.						
January.....	3,764					
February.....	7,915					
Total.....	49,300	343	200	7,277	0.42	15.39

NOTE.—These figures are believed to include accidental wounds. The maximum was reached for kakke in August.

406 MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR.

Sickness classified by disease, Second Army.

TROOPS AT THE FRONT.

Month.	Total number of sick, end of month.	Noncontagious.	Contagious.		Kakke.	Percentage.		
			Dysentery.	Typhoid fever.		Noncontagious.	Typhoid fever.	Kakke.
1904.								
May.....	324	320	0	2	2	98.76	0.65	0.65
June.....	682	645	5	4	28	94.59	.59	4.10
July.....	1,520	1,182	142	10	186	77.63	.65	12.23
August.....	2,165	1,409	116	10	630	65.08	.46	29.60
September.....	1,714	899	26	17	572	52.45	.90	33.37
October.....	1,846	1,114	48	66	618	60.34	3.56	33.45
November.....	1,721	959	5	66	691	55.72	3.82	34.34
December.....	883	449	0	18	416	50.84	2.03	47.11
1905.								
January.....	1,356	790	0	5	561	58.25	.36	41.39
February.....	2,300	1,446	1	2	881	60.26	.08	38.30
March.....	1,444	892	0	4	548	61.77	.28	37.95
April.....	1,241	827	1	26	383	66.64	2.00	30.86
May.....	1,665	1,224	1	27	420	72.21	1.65	24.77
June.....	1,103	.....	19	33	273	70.53	2.99	24.75
July.....	1,571	.....	15	107	333	71.04	6.81	21.17

TROOPS ON THE LINES OF COMMUNICATION.

1904.								
May.....	.....	.....	.....	.....	.....	.....	.....	.....
June.....	1,782	1,498	3	0	85	84.06	0.00	3.08
July.....	4,935	3,514	151	0	682	71.20	.00	13.81
August.....	4,233	2,076	43	6	1,901	49.06	.04	44.90
September.....	2,635	1,035	28	4	1,405	39.25	.15	53.32
October.....	2,461	1,191	5	8	980	48.35	.32	38.56
November.....	1,811	1,079	0	8	577	59.57	.44	39.99
December.....	2,010	1,222	3	6	649	60.79	.29	32.23
1905.								
January.....	1,466	772	0	1	476	52.66	.07	32.53
February.....	1,919	1,153	0	0	636	60.08	.00	33.14
March.....	2,564	1,560	0	3	554	60.84	.11	21.60
April.....	1,915	1,240	0	11	474	64.75	.57	24.73
May.....	2,005	1,442	0	10	304	71.42	.49	15.11
June.....	.....	.....	.....	.....	.....	.....	.....	.....
July.....	.....	.....	.....	.....	.....	.....	.....	.....

* Not compiled.

REMARKS.—In the first table accidental wounds are not counted, while in the second they are included.

The numbers given in the first table for the months May to September, inclusive, 1904, are only approximately correct.

In the first table the following should be added to the cases of contagious diseases: Variola, April, 1905, 4 cases; May 13, June 7, and July 5.

Wounded classified according to kind of wound, — Division, Second Army, Nanshan to the Sha River, inclusive.

Bullet wound.....	5,419
Shell wound.....	524
Bayonet and other wound.....	465
Total.....	6,408

REMARKS.—The large total of bayonet and other wounds is due to the fact that accidental wounds are here included.

In 5,398 of these rifle wounds, 3,638 passed through the body, 989 lodged, and 772 were scratches.

Wounded classified according to kind of wound, battle of Mukden.

Division.	Bullet wound.	Shell wound.	Bayonet wound.	Total.
Third.....	1,451	140	32	1,632
Fourth.....	2,050	319	6	2,375
Fifth.....	1,938	113	0	2,051
Eighth.....	3,041	776	5	3,822

REMARKS.—The 32 bayonet wounds given for the Third Division include 13 accidental wounds.

Neither of these tables is complete, but the relative proportions of wounds due to different missiles are believed to represent those for the entire number.

Locality of wounds.

[Figures based on 7,480 cases not selected.]

Head and neck.....	1,204
Trunk.....	2,270
Arms.....	1,894
Legs.....	2,116
Sexual organs.....	15

REMARK.—Of the wounded of the Second Army, 19 per cent recovered in the field, 65 per cent were sent to Japan, and 16 per cent died.

Percentages of wounded according to branch of service.

Infantry.....	36.27
Engineers.....	14.33
Artillery.....	8.44
Cavalry.....	6.22
Sanitary corps.....	5.52
Surgeons, etc.....	4.66
Train.....	.51

REMARK.—This table is for the period from the landing of the Second Army, in May, 1904, to include the month of January, 1905.

Number of wounded cared for in field hospitals, Second Army.

Name of battle.	Total number of wounded.	Number of field hospitals opened.	Average number of patients.
Nanshan.....	3,927	6.5	603
Telissu.....	963		
Kaiping.....	143		
Tashihchiao.....	903		
Haicheng.....	44		
Anshantien.....	271		
Liaoyang.....	7,414		
Sha River.....	6,211		
After the Sha River.....	1,400		
Mukden:			
Third Division.....	2,373	5	474.6
Fourth Division.....	4,317	8	539.8
Fifth Division.....	4,943	8	617.9
Eighth Division.....	5,234	7	747.7

NOTE.—The Second Army varied in strength at these different engagements, nor was it always composed of the same organizations. At Nanshan the Japanese forces consisted of three divisions and one extra artillery brigade; at Telissu of two and one-half divisions with one extra cavalry brigade and one extra artillery brigade; at Kaiping of four divisions and one extra cavalry brigade and one extra artillery brigade; at Tashihchiao of four divisions and one extra artillery brigade; at Haicheng of two divisions and several extra regiments of cavalry and artillery; at Anshantien of three divisions; at Liaoyang of three divisions, one extra brigade each of infantry, cavalry, and artillery, and several additional regiments of cavalry and artillery; at the Sha River of three divisions, one extra brigade each of cavalry and artillery, and several extra companies of heavy artillery; after the Sha River, the Fifth Division and four regiments of cavalry and artillery were constantly engaged against the enemy. The figures given for that period include the casualties in the Heikoutai battle, but as only part of the Second Army fought there its loss was comparatively small. At Mukden the Second Army had four divisions, one extra brigade each of infantry, cavalry, and artillery, and several extra companies of heavy artillery.

408 MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR.

Killed, wounded, and missing in the Second Army from May 6, 1904, to December 19, 1904.

Date.	Killed.		Wounded.		Missing.		Total.
	Officers.	Men.	Officers.	Men.	Officers.	Men.	
May 6 to 31.....	34	695	137	4,022		3	4,861
June 1 to July 1.....	9	204	46	960		1	1,221
July 2 to 31.....	10	189	56	1,113		4	1,372
August 1 to 29.....	1	66	19	331		4	421
Aug. 30 to Sept. 28.....	106	2,630	247	7,174		85	10,243
Sept. 27 to Oct. 19.....	46	1,009	214	6,002	4	298	7,573
Oct. 20 to Nov. 19.....	4	98	18	482		1	603
Nov. 20 to Dec. 19.....	1	26	6	253		6	292
Total.....	210	4,917	743	20,337	4	402	26,615

Killed and wounded, by division, in the battle of Nanshan.

Division.	Killed.		Wounded.		Horses.	
	Officers.	Men.	Officers.	Men.	Killed.	Wounded.
First.....	14	202	41	1,102		14
Third.....	6	131	32	1,222	6	
Fourth.....	8	298	28	1,303	1	
Artillery.....		15	5	43	11	5
Fifth Battalion Engineers.....	1	5		8		
Total.....	29	651	106	3,678	18	19

Killed in the Second Army.

Nanshan.....	683
Tellssu.....	206
Kaiping.....	22
Tashihchiao.....	159
Haicheng.....	8
Anshantien.....	46
Liaoyang.....	2,727
Sha River.....	1,052
After the Sha River.....	259
Mukden.....	5,908
Grand total.....	11,070

REMARK.—For the strength of the Second Army at these various engagements, see statistical table on number of wounded cared for in field hospitals.

Statistics of sickness in the Third Army from the moment of its landing up to the present time (June, 1904–July, 1905).

	New patients.	Recovered.	Dead.	Sent back.
1904.				
June.....	506	339	4	163
July.....	3,615	2,399	11	1,105
August.....	11,294	6,845	26	4,423
September.....	7,043	4,365	20	2,658
October.....	4,632	3,181	20	1,431
November.....	4,104	2,982	7	1,115
December.....	2,494	1,893	8	583
1905.				
January.....	1,576	1,100	8	468
February.....	1,642	1,072	5	564
March.....	1,414	892	4	518
April.....	1,004	741	8	518
May.....	1,131	855	7	269
June.....	1,133	832	12	289
July.....	1,375	1,041	9	325
Total.....	42,963	28,538	149	14,429

NOTE.—The above list includes both troops at the front and those on the lines of communication.

MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR. 409

Patients classified by the nature of sickness in the Third Army.

FIELD FORCES.

Month.	Total number of patients.	Nonepi- demic.	Epidemic.		Beri- beri.	Percentage.		
			Dysen- tery.	Typhoid.		Nonepi- demic.	Epi- demic.	Beri- beri.
1904.								
June.....	489	433	2	11	43	88.55	2.66	8.79
July.....	3,295	2,209	124	30	932	67.04	4.67	28.29
August.....	10,985	5,483	360	14	5,128	49.92	3.40	46.68
September.....	6,690	4,096	109	13	2,472	61.23	1.82	36.92
October.....	4,424	3,171	268	81	904	71.66	7.89	20.43
November.....	3,938	2,997	59	71	811	76.11	3.30	20.59
December.....	2,326	1,922	12	24	438	80.22	1.50	18.28
1905.								
January.....	1,365	1,095	4	9	257	80.22	.95	18.83
February.....	908	776	2	3	127	85.46	.55	13.99
March.....	767	739	6	.....	22	96.34	.78	2.88
April.....	617	586	3	9	19	94.98	1.94	3.08
May.....	647	609	4	11	23	94.13	2.32	3.55
June.....	592	550	8	8	26	92.91	2.70	4.39
July.....	853	788	15	18	39	92.38	3.05	4.57
Total...	37,966	25,454	976	302	11,241	67.04	3.35	29.61

Lines of Communication.

1904.								
June.....	17	15	.....	.....	2	58.24	.....	11.76
July.....	220	156	33	.....	31	70.91	15.00	14.09
August.....	309	154	6	1	148	49.93	2.26	47.81
September.....	353	165	7	3	178	46.75	2.83	50.42
October.....	208	150	3	6	49	72.12	4.34	23.55
November.....	166	139	1	5	21	83.73	3.62	12.65
December.....	88	74	1	4	9	84.09	5.68	10.23
1905.								
January.....	211	184	.....	.....	27	87.20	.....	12.80
February.....	734	691	.....	.....	43	94.14	.....	5.86
March.....	647	585	1	3	58	90.42	.62	8.96
April.....	387	355	.....	3	29	91.73	.78	7.49
May.....	484	423	.....	10	51	87.40	2.06	10.54
June.....	541	474	9	6	52	87.62	2.77	9.61
July.....	522	448	21	4	49	88.82	4.79	9.39
Total....	4,887	4,013	82	45	747	82.12	2.59	15.29

MILITARY OBSERVATIONS—RUSSO-JAPANESE WAR. 411

Statistics of wounds in the Third Army, classified in accordance with severity.

	Severe wound.	Less severe wound.	Slight wound.	Total.	Percentages.		
					Severe.	Less severe.	Slight.
First Division.....	2,697	6,758	1,053	10,508	25.68	64.32	1.00
Seventh Division.....	2,323	6,092	85	8,500	27.33	71.67	1.00
Ninth Division.....	4,903	12,474	113	17,490	28.03	71.32	1.65
Eleventh Division.....	2,948	6,618	417	9,984	29.53	66.30	4.17
Auxiliary force.....	2,441	7,879	417	10,739	22.74	73.38	3.88
Total.....	15,312	39,821	2,085	57,221	26.76	69.60	3.64

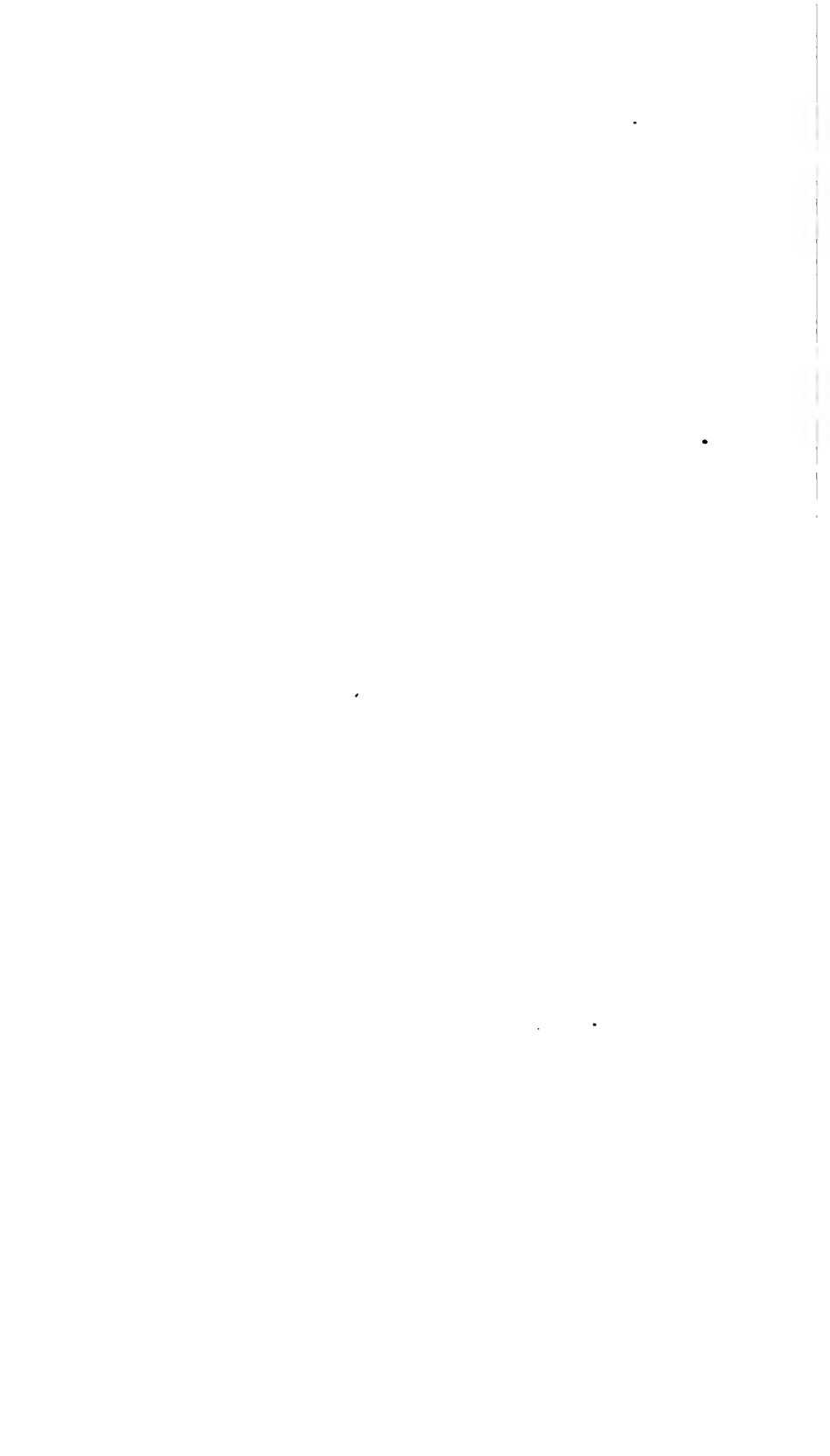
Number of field hospitals and number of wounded received by them in the Third Army.

	Hospitals established.	Total number of wounded received by the hospitals.	Average number received by each hospital.
First Division.....	(Completely.. 27 Partly..... 6	18,830	626
Seventh Division.....	(Completely.. 11 Partly..... 13	9,180	524
Ninth Division.....	(Completely.. 18 Partly..... 4	21,490	1,075
Eleventh Division.....	(Completely.. 15 Partly..... 6	12,035	669
Total.....	(Completely.. 71 Partly..... 29	61,535	720

NOTE.—In the above list only wounded in battle are shown; 562 Russians are included.

Number of killed in battles in the Third Army, June, 1904, to July, 1905.

First Division	3,012
Seventh Division	2,951
Ninth Division	5,448
Eleventh Division	4,319
Auxiliary force of armies	3,637
Total	19,367



APPENDIX VII.

BATTLE OF MUKDEN.

Just before the battle of Mukden an opportunity to join either the Fifth or Eighth Division of the Second Army was offered to the foreign attachés with that army. I took advantage of this, and on February 28 went from Koutzuyen, the headquarters of the army, to the headquarters of the Eighth Division, at Sumapu. I remained with the division until March 9, when orders were issued directing all attachés with it to return to army headquarters. The Japanese stated that as the Eighth Division was to reenforce the Third Army, it was no longer practicable for the foreigners to stay with the former. After rejoining army headquarters, I remained with it till the end of the battle, visiting the site of the fierce fight of the Third Division at Likuanpu on March 11 and entering Mukden on the same day. After the battle I had opportunities to visit the battlefield and also to investigate the hospitals and the transportation of the wounded to the south. Observation at a division during a battle possesses certain advantages, as one is in much closer touch with the field medical organization there than at army headquarters. I was especially fortunate at Mukden, as I secured the entire services of an official interpreter during the whole time I stayed with the division. This was by no means a common occurrence, as there were so many more attachés than interpreters.

My personal observation of the battle, if close, so far as the Eighth Division was concerned, was necessarily pretty well confined to that division, though I was able to see a little of the work of the divisions to our right and left. I am much indebted to Medicin-Major Martignon, French army, who was with the Fifth Division on the right of the Eighth for

details in reference to the operations of the medical department of that division during the battle. For a long time after the battle, too, I was quartered near the Fifth Division headquarters, so that no obstacles were thrown in the way of visiting it, and so far as his orders permitted, Colonel Haga, its chief surgeon, was always glad to give information to foreign medical officers. For these reasons the data on the medical departments of both the Fifth and Eighth Divisions are rather complete. Some few points are even better covered in the Fifth Division than in the Eighth, as with the latter the observer was absolutely dependent on what he saw himself. The medical department data in reference to the rest of the Second Army were obtained partly by observation, for the most part subsequent to the battle, and partly from the surgeon-general of the Second Army. The movements of troops, etc., except for some details in reference to the Eighth Division, are taken almost verbatim from a report of the battle furnished to the attachés from second army headquarters.

A large map accompanies this report. Besides the lines of the troops and some of the artillery, this shows the field hospitals and dressing stations of the Fifth and Eighth Divisions in detail. Some of the field hospitals of the other divisions also appear on it and all the line of communication medical department organizations common to the Second Army with the lines for the evacuation of wounded. Some of the temporary dressing stations of the Fifth and Eighth Divisions have been entered. Those shown illustrate the position of these stations in respect to the firing line and artillery positions in a fairly satisfactory manner. In general terms each battalion of infantry found it necessary to establish one such station whenever it was engaged with the enemy, but artillery regiments often needed but one station. The temporary dressing stations were extremely mobile, and it is doubtful if even the battalion surgeons could tell exactly every place where they had opened them during the course of the long battle. No attempt has been made, therefore, to indicate even the positions of all such stations for which data are at hand, as they would necessarily be incomplete and would complicate the map unnecessarily.

The dates on which each field hospital and each dressing station of the Fifth and Eighth Divisions and each stationary hospital were open are shown on the map, and at the end of the description of the work of the medical department for each day of the battle a statement is made of all such organizations open on that day. At the end of the text a summary shows the places where such medical department organizations were located, with the number of patients received. In consulting the map it should be remembered that these organizations were really in and not near the town as shown. One temporary dressing station, dressing station, and field hospital was so like every other one of the same class during the battle that these organizations will be described in detail for the first day of the battle, and thereafter only special points of interest in regard to them will be mentioned. The usual difficulties in regard to names of Manchurian towns have been met with in the preparation of this map from half a dozen smaller maps and from data gathered from various sources. The principal towns have therefore been numbered in accordance with the official report of the battle prepared at Second Army headquarters.

Names of places have all been corrected on the map and in the text so that they now correspond in these two places.

GENERAL CONDITIONS BEFORE THE BATTLE.

“Before the battle of Mukden the front of the Second Army extended from opposite Shahopu to opposite Changtang (2) on the west. Both hostile forces faced each other at close distances in deeply intrenched positions, and after the battle of Heikoutai the strength of the works on the west increased considerably. The enemy used to fire on us day and night with their artillery and also frequently send reconnaissance against us.

“During the month of January a change was made in the distribution of the troops of the Second Army. The Third Division was withdrawn from its old position across the Mukden highway and the Sixth Division was extended to the east to take its place. After being withdrawn from its

old position, the Third Division was sent to the west to garrison Chentanpu (3) and Yapatai (4), the order of divisions in the Second Army, therefore, counting from right to left, was first the Sixth, then Fourth, and, lastly, the Third Division. In addition to them, but not under the Second Army, were the Fifth and Eighth Divisions, holding the front from opposite Changtang (2) to Heikoutai (4A).

On the 3d of February the main body of General Akiyama's cavalry brigade was at Sanchiatzu (5), with detachments at Chitaitzu (6) and Mamikai, keeping connection with and covering the movement of the Third Army, which was gradually concentrating at Hsiaopeiho. The headquarters of the Second Army were at Koutzuyen (21), and its reserve partly there and partly at Langtungkou (10).

On the 17th of February the Fifth and Eighth Divisions and the Kobe brigade were added to General Oku's command, and the Sixth Division was transferred to the Third Army. The front of the Second Army, therefore, extended from the southwest of Linshinpu (11) to Heikoutai (4A). Orders were at the time issued by Marshal Oyama that the Third Division was to be withdrawn from the neighborhood of Chentanpu (3) and placed in reserve, though one regiment might be retained by the Second Army, if required; and the plan of battle, so far as the Second and Third Armies were concerned, was disclosed to the extent that the Second Army, cooperating with the Fourth Army on its right hand, making its left the pivot for the Third Army to wheel upon, and awaiting the advance of the latter, was to attack the enemy with all its force from Linshinpu (11) to Chentanpu (3). None of these transfers were to take place before the 20th of February, and the Third Division was to remain under the command of the Second Army until the 25th of that month. On receipt of these orders the commander of the Second Army decided to make Changtang (2) the main point of his attack and foresaw that it would be necessary for him to reduce the strength of his forces on his right and increase them on his left, in order to achieve this object. He planned, therefore, that that part of the first line which lay between the left of the Sixth Division and Hsiaotai (12), and which was held by a part of the Fourth Division, should be given up to the Eighth Kobe Brigade,

and that the Fourth Division should prolong its troops to the west, so as to be able to take up its positions at Chentanpu (3) and Yapatai (4), which were then being held by the Third Division.

“He therefore issued on the 21st of February the following orders:

“(1) The Eighth Kobe Brigade, under the command of General Tomioka, with the following in addition from the Fourth Division: Three battalions of infantry, one section of cavalry, one battalion of artillery, one captured battery, one battery of heavy guns, and one company of engineers will be formed into a separate detachment under the Second Army, to be called “Tomioka’s detachment.” This detachment must hold the front line from the left of the Sixth Division (southwest of Linshinpu (11) to Hsiaotai (12).

“(2) The Fourth Division will then close to its left and relieve the Third Division at Yapatai (4) and Chentanpu (3) on a date that will be notified hereafter.

“(3) One battalion of independent field artillery will be attached to the headquarters of the Sixth Division.

“(4) A portion of the Third Division will remain on the Tapingchuan (13) Litajentun (14) line, and the remainder will proceed to Koutzuyen (21) and join the Manchurian army’s general reserve.

“(5) The Fifth Division, less the main part of its cavalry regiment, will remain in position as it now is; that is, on the line from Chentanpu (3) to Malengtzu (32) and prepare for the coming advance, but one regiment of infantry should remain at Tatai (16), near Kinchentzu (17), as part of the reserve of the Second Army.

“(6) One battalion of independent field artillery will be attached to the Fifth Division.

“(7) The Eighth Division will hold its present position and prepare to attack, but one regiment of infantry will be left at Kinchentzu (17) to form part of the army reserve, and the additional cavalry regiment, less one squadron, will join Akiyama’s cavalry brigade; one battalion of independent field artillery will join this division.

“(8) Akiyama’s cavalry will continue to carry on its present work and will be ready to advance at short notice

after the 26th. The Eighth Regiment of Cavalry will join this brigade and relieve the Tenth Regiment. The latter on relief will rejoin its own army.

“(9) The heavy artillery will remain in its present position, but will be ready for an immediate move any time after the 25th.’

“In accordance with above orders every preparation was to be completed by the evening of the 25th, on which date the Second Army would be composed as follows:

“(1) Tomioka’s detachment, to hold the line from west of Linshinpu (11) to Hsiaotai (12): Eighth Kobe Brigade; and from the Fourth Division; three battalions of infantry; one section of cavalry; one battalion of field artillery; one battery of captured field artillery; one battery of heavy guns; one company of engineers; ten machine guns.

“(2) Fourth Division from the left of Tomioka’s detachment to Chentanpu (3): Fourth Division less the troops as above given to Tomioka; one cavalry regiment less one section; one battalion of independent field artillery; thirteen machine guns.

“(3) Fifth Division, from the left of the Fourth Division through Liutiaoko (22) to Malengtzu (32): Fifth Division less one infantry regiment in army reserve; one battalion of independent field artillery; six machine guns.

“(4) From the left of the Fifth Division to Tunghuanlotatzu (28) through Erhchiahotzu (14): Eighth Division less one regiment of infantry in army reserve and the one regiment cavalry transferred to Akiyama, but with the following additional troops: One battalion independent field artillery; ten machine guns.

“(5) Cavalry in neighborhood of Sanchiatzu (5) to protect left and rear: First Cavalry Brigade (Thirteenth and Fourteenth Regiments); Third Cavalry Regiment; Fourth Cavalry Regiment; Fifth Cavalry Regiment; Sixth Cavalry Regiment; Eighth Cavalry Regiment (about five regiments less one squadron each), and one regiment of Kobe infantry.

“(6) Reserves at Tatai (16), Kinchentzu (17), Koutzuyen (21), and at Langtungkou (10): One regiment Fifth Division; one regiment Eighth Division; Thirteenth Field Artillery Regiment of First Artillery Brigade; one section cavalry from Fourth and Fifth divisions; heavy artillery

brigade, eleven batteries in all; captured howitzers and one company of Kobe engineers.

"Tomioka's detachment was in position by 6 p. m. of the 24th, having relieved a portion of the Sixth Division as ordered; the Thirteenth Regiment of Field Artillery from the army reserve was temporarily placed under the orders of the commander of the heavy artillery brigade on the same day. The headquarters and main part of the Third Division reported themselves to Manchurian headquarters on the 23d as previously arranged, but the Thirty-fourth Regiment and one battery of captured howitzers remained at Tapingchang (13) and came under the orders of the commander of the Fourth Division.

"All preparations ordered to be made by the Second Army were thus completed on the 26th of February.

CONDITIONS OF THE ENEMY.

"On the 19th one more Russian division with artillery was transferred to the west from in front of the First Army.

"From the 20th onward, Russian artillery, both heavy and field, was continually firing, day and night, especially against Baotaitzu (124) and Chentanpu (3), in order to cover the construction of defensive works which the enemy were busily engaged in throwing up against these points. Sometimes a company and sometimes a battalion of infantry would come against us, more especially at night. Conflicts between patrols were constant and Russian balloons kept a steady lookout on us by day.

CONDITION IN FRONT OF THE OTHER ARMIES.

"The Third Army was to advance on the 27th, and its advanced troops were to be on the line from Kalima (north-west of Mamikai on Liao River) to Mamikai on that date.

"At 6 p. m. on the 26th, General Oku issued the following orders:

"(1) In order to conceal the movements of troops which are going on, the artillery of the Second Army, in concert with that of the First and Fourth Armies, will bombard the enemy to-morrow, the 27th.

“(2) Each division of the army, including General Tomioka's detachment, will fire against the enemy for one hour from 8 a. m., and again for one hour from 12 noon. As this bombardment is only a ruse none of the heavy guns will fire and only a part of the others at one time, in order to conceal the strength of our artillery from the enemy.

“(3) Akiyama's detachment will cross to the right bank of the river Hun to help the advance of the Third Army, and will keep communication between the Second and the Third Armies.

“(4) The Fifth Division will send one regiment of infantry to Kinchentzu (17) at the same hour to join the general reserve of the army (this is the same regiment which was warned to be held in readiness for the above purpose).’

PHYSICAL FEATURES OF THE BATTLEFIELD.

“The field of operations of the Second Army included both banks of the river Hun and the districts west and south of Mukden. The villages scattered over this area are some partly and some wholly surrounded by the mud walls which inclose the courtyards of the houses. In many cases the walls are made of burnt brick. Owing to the frost even the mud walls were impenetrable to rifle bullets, and afforded considerable resistance to shell fire. The villages were easy to defend if held stubbornly and easy to place in a state of defense, and therefore became the points which had to be attacked and defended in almost all cases. The river Hun is from 100 to 200 yards wide, with precipitous banks, but was frozen, and when once its bed could be reached, formed no obstacle to all three arms. Small, nameless, and frozen streams flowed into it in many places through deep, precipitous banks, which formed serious obstacles to the attack, but afforded excellent cover for supports and reserves in rear. The ground was frozen for several feet in depth, rendering the construction of hasty fieldworks impossible, but all three arms could move easily over its hard surface. In fact, the whole country was practicable for vehicles.” This was true even of the fields where kaoliang had been grown, though they were so rough on account of deep furrows with intervening ridges as hard as iron that they impeded all wheeled transportation to

a considerable extent and delayed infantry advancing. "All the timber had been removed from the villages which had been occupied by the Russians and burnt as firewood, the garrisons being accommodated in underground dwellings in rear; they therefore gave no cover whenever we occupied them. Most of them were in ruins and contained no supplies, not even a vestige of fodder, but the weather was warm compared with what it had been in the months of January and February and we suffered from no cases of frostbite." (This statement is not absolutely correct. In reality there were 267 cases of frostbite in the Second Army during the battle of Mukden, 191 of which occurred in wounded.) The maximum and minimum temperatures for the days of the battle were as follows:

	Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.		Maxi- mum.	Mini- mum.
	°F.	°F.		°F.	°F.		°F.	°F.
Mar. 1	39	10	Mar. 5	34	7	Mar. 9	48	17
2	42	10	6	36	9	10	46	21
3	34	12	7	41	14	11	46	17
4	36	9	8	46	18			

"At 3 a.m. on the 27th of February the enemy made a reconnaissance by night against the village of Honchi (25), with one company, and sent two companies more against a nearby village, both held by Tomioka's detachment, but were in both instances repulsed. In accordance with the orders of the 25th all our artillery opened deliberate fire in the morning and again at noon. This was replied to by the enemy and we were able to ascertain the number, position, and description of his guns. The enemy bombarded our lines again until night and sent small reconnoitering parties against them, but they were in every instance repulsed.

"No charge took place in Tomioka's detachment, and the whole army spent the night on the positions they were occupying. Army headquarters remained at Koutzuyen (21) and its reserve there and at Takai (16), Langtunkou, and Kinchentzu (17).

"The Third Army arrived this day at Lotouku, Luwakantzu, and Pataitzu, and at Tsuyutai, Tahoanchipu, and Chentzoukou the next day.

"The following orders were issued at 10 p. m. on the 27th by General Oku:

"(1) The army will be prepared to advance from early dawn on the receipt of orders.

"(2) Every division will be prepared to advance from early dawn on the receipt of orders.

"(3) The Eighth Division will bombard Houmahulingzu with part of its artillery, in order to assist the advance of Akiyama's cavalry.

"(4) The heavy artillery brigade will take up a position near Liutiaoko (22) before dawn.

"(5) Akiyama will keep up connection between the Second and Third Armies with his cavalry and seize both villages of Mahulingtzu (Houmahulingtzu and Cheinmahulingtzu), in order to assist the advance of the Third Army.

"(6) The general reserve, namely, the Thirty-first and Forty-second Regiments, will rendezvous at their own quarters at dawn.

"With the issue of the above orders discretionary powers were given to the commanders of all divisions to open deliberate fire on the enemy should they at any time consider it advisable to do so."

"The 28th of February Akiyama's detachment, with a view of assisting the advance of the Third Army, advanced from Sanchiatzu (5), drove back the enemy's cavalry and infantry, and by sunset occupied the villages of Mahulingtzu with his main body, and Huanlotaitzu (Tunghuanlotaitzu and Hsihuanlotaitzu) (28), Toutaitzu (20), and Hsiaohenwai with detachments. The Eighth Division Artillery bombarded the villages of Toutaitzu and Mahulingtzu and assisted in the attack on them.

"During the day the First Army occupied positions on the hills northeast of Hsikouling and north of Wanfuling and also the hill south of Sungshuthuitzu and awaited the moment to attack. The left wing of the First Army and the whole of the Fourth Army continued the bombardment of the enemy's lines begun on the 27th. This was the first day on which the 28-centimeter howitzers were employed. They fired on Talientun and other villages with excellent results, both moral and physical. The Third Army ar-

rived on the line mentioned above with its right resting on Santonkao at 9.45 a. m.

“General Oku issued the following:

“(1) The army will attack the enemy to-morrow from Hsinshantun (31) to Changtang (2).

“(2) The Fifth Division will, in the early morning, attack from Chentanpu (3) to Malengtzu (32) and endeavor to occupy Shoukuanpu (24).

“(3) The Fifth Regiment of field Artillery and the independent field battalion of this division will be placed under the orders of the general commanding the heavy artillery brigade; the latter will be given one company of engineers from this division should he ask for it.

“(4) The Fourth Division, acting in concert with the Fifth, will attack the enemy on the line from Peitaitzu (34); Huanchi (35), north of Yapatai (4), and Hsinshantun (31), and try to occupy Kuchiatzu (23) and Erhtaitzu (37).

“(5) The Eighth Division, in concert with the Fifth, will advance to attack Changtan (2) and take line from Malengtzu (32) to Toutaitzu (20).

“(6) The heavy artillery brigade will commence bombarding Lichiauwopeng (38) and Wangchiauwopeng (39) at dawn, to assist the attack of the Fifth Division. It will next bombard the enemy at Changtan (2) and assist in covering the advance of the Eighth Division, and at the same time assist the Fourth Division with some of its guns. All the artillery of the Fifth Division will be placed under the orders of the general commanding the heavy brigade, who will obtain one company of engineers from that division if he should require it.

“(7) Tomioka's detachment will bombard Tamuchinyen (40) and Talientun and assist the attacks of the other divisions.

“(8) Akiyama's detachment will keep up the connections between the Second and Third Armies, protect the left flank of the Second Army, drive back the enemy on its own front, and generally assist in the attacks of the other divisions.

“(9) The general reserve will assemble at Tatai (16) and Kinchentzu (17) at 6.30 a. m.

“Special instructions were also given to General Tomioka

not to advance from his trenches, but to contain the enemy to his front and that if attacked he was to hold his position to the last man. All troops passed the night in their positions. Army headquarters were at Koutzuyen (21) and the division at Taitai (16) and Kinchentzu (17)."

MEDICAL DEPARTMENT PREPARATIONS FOR THE BATTLE.

As has been seen from what has been quoted above, the Japanese made elaborate plans for the battle at Mukden long before it actually commenced. The medical department, according to regulations, had full information on contemplated movements leading up to the battle, and therefore was able to make complete preliminary arrangements for its own work. All lines of communication hospitals in Manchuria had been cleared of patients so far as was possible, and as it was expected that the brunt of the medical work of the lines of communication would fall on Liaoyang, all patients there who could possibly bear transportation had been sent to the rear, and the hospital personnel had been greatly augmented.

During the battle some 80 surgeons and 700 nurses were in attendance on patients there. Yentai, which was a branch of Liaoyang, was also operated as a large hospital during the battle. A first personnel from it went toward the front, and the remainder became a rest station. At about the time of the battle of Hotchkiss, or perhaps, even earlier, a line of communication hospitals had been established at Langtientsz. This was cleared of patients before the battle at Mukden, and its personnel was increased.

Before the battle the Sanitary Reserve Personnel of some divisions of the Second Army had stationary (station) hospitals in operation at Lintunkou and Shantaitzu. The former was closed on November 17, 1904, and the latter on November 18, 1904. These hospitals were also cleared of patients. So far as could be learned all the field medical organizations of the divisions and other organizations composing the Second Army at the front had been cleared of patients before the battle commenced, and had been brought correspondingly to the rear of the organizations to which they belonged, subject to the orders of the division surgeons, etc.

Just how far toward the front the Japanese brought their division medical supply depots in preparation for the battle is unknown, but it is probable that one such depot was in the vicinity of Langtungkou (10) and another not far from Liaoyang. As has been mentioned, however, they did not depend to a large extent on supplying their divisional, line of communication and field medical organizations during the battle, but rather on loading them down heavily before the action commenced, only holding the depots in readiness to furnish extra supplies in case those issued by them previously were exhausted.

The increase in these supplies at Mukden consisted mainly of litters, blankets, food, forage, and surgical dressings (the field hospitals, for example, had 1,200 blankets at that battle and each half of a sanitary company had at least 90 litters.) The Sanitary Reserve Personnel, the field hospitals, and the sanitary companies each had about five times the regulation amount of supplies. Those of the transport departments for patients were not greatly increased, except the litters and blankets, and from 8 to 10 litters were carried by each battalion on its pack transportation. It was, of course, necessary to increase largely the amount of transportation in order that these additional supplies might be carried by the various medical department organizations. Each half section of a sanitary company was, therefore, given six Chinese carts in addition to its regulation allowance of transportation, while each field hospital had ten such carts additional, and each battalion had an extra pack animal for medical supplies. The Sanitary Reserve Personnel units also had their transportation proportionately increased. During the course of the battle even more transportation was occasionally hired from time to time by these organizations when it was needed. Coolies were also freely hired as required. These men, when employed by sanitary companies, received 2 yen per day on account of the extra hazardous nature of their work, instead of their regular rate of pay, which varied from 60 to 80 sen. Each Sanitary Reserve Personnel had hardly more than twelve coolies in addition to the drivers of their hired carts, but the transportation department for patients, at times, had hundreds in service. The number of

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During the battle some 80 surgeons and 700 nurses were in attendance on patients there. Yentai, which was a branch of Liaoyang, was not operated as a large hospital during the battle. In fact, personnel from it went toward the front, and it ultimately became a rest station. At about the time of the battle of Heikoutai, or perhaps, even earlier, a line of communication hospitals had been established at Langtungkou (10). This was cleared of patients before the battle of Mukden, and its personnel was increased.

Before the battle the Sanitary Reserve Personnel of some of the divisions of the Second Army had stationary (station) hospitals in operation at Liutunkou and Shantaitzu. The former was opened on November 17, 1904, and the latter on February 16, 1905. These hospitals were also cleared of patients. So far as could be learned all the field medical organizations of the divisions and other organizations comprising the Second Army at the front had been cleared of patients before the battle commenced, and had been brought immediately to the rear of the organizations to which they belonged, subject to the orders of the division surgeons, etc.

cover of darkness. The artillery came into action near Toutaitzu (20) against Changtan (2) and Yuehpaotzu (42). The main body of Akiyama's detachment arrived at 7 a. m. at Toutaitzu (20) and at 9 a. m. its artillery commenced shelling the enemy at Tungyupao (47). Part of this force occupied Houmahulingtzu and the hills west of the village.

"Every division began to attack as above, but the enemy facing the Fourth and Fifth Divisions were in strong defensive works, received strong reinforcements, and resisted stubbornly. His artillery was also largely augmented, and by nightfall we counted no less than 250 guns opposed to the Second Army. The attacks of the Fourth and Fifth Divisions continued. The latter succeeded in occupying the hill south of Wangchiawopeng (39), but were kept back by the enemy's machine guns, lost heavily, and were unable to make any headway. A part of Akiyama's cavalry advanced and at 12.50 occupied Chandiopa (45), but the enemy's artillery at Ssufangtai (46) and on the hills west of that place shelled them heavily.

"The part of the Eighth Division on the right bank of the Hun marched headlong under the enemy's fire, and at 1 p. m. occupied Yuehpaotsu (42), but on advancing toward Nienyupao they came under severe artillery and infantry fire from Changtan (2) and met with so strong a resistance from Nienyupao that they were unable to occupy the latter place. At 2.30 p. m. the army commander sent two battalions of the Thirty-first Regiment to reenforce them; but even with this assistance they could make no farther advance, and the sun set.

At 8 a. m. on this day the enemy sent one regiment of infantry and three batteries of artillery from the north, and again at 9 a. m. one regiment of infantry from the northeast to Ssufangtai (46), and we received information that the Third Army was attacking that place at 4 p. m., but no news regarding the result was received that day.

"The Fifth Division was time after time in a critical condition, and at 5.30 p. m. one battalion of the Forty-second Regiment, under the regimental commander, was sent to reenforce. Although every division had tried its utmost to succeed, the day ended without our having seized any portion

of the enemy's line, but the Fourth and Fifth Divisions, assisted by field and mountain guns, pushed on to the hills southeast of Lichiaiwopeng in the twilight of that evening, and we at last, at 8 p. m., succeeded in occupying the hill, but the enemy still remained behind the village-defense works and resisted us stubbornly. Our attack against Wangchiawopeng, although carried out with the utmost vigor, failed, and we lost heavily, but were able to remain in position facing the enemy at close quarters. The enemy at both places received reinforcements, and attacked us in turn, but were driven back to their trenches.

"The troops of the Fourth Division, who attacked the redoubt west of Peitaitzu (34), established themselves within short range and prepared to assault it night.

"No change took place in front of the Fourth Division from Yapatai to the east or in front of Tomioka's detachment; both sides continued to exchange deliberate artillery fire.

"Army headquarters spend the night at Koutzuyen (21), and the reserve remained at Tatai (16). At 9 p. m. General Oku issued orders that the attack would be continued on the following day.

"On the 1st of March a part of the Fourth Army commenced to attack Mampanshan. Information was received from them that the greater part of the enemy facing Tomioka's detachment had gone north and that an additional force of about one and one-half divisions had also marched north by the road bordering the railway line; in all about one Russian army corps, and that it seemed that the enemy were retiring. Information was also received that the First Army was to attack Tongkongshan that night.

"Orders were received from Manchurian army headquarters at 11 p. m. that night that Akiyama's detachment would be transferred to the Third Army from the next day (March 3), excepting the Fifth and Eighth Regiments of Cavalry and one Kobe regiment which would remain under General Oku's orders. These were then placed under the command of the general officer commanding the Eighth Division."

The good methods which the Japanese pursued for furnishing their troops in contact with the enemy with food

and other supplies were observed on March 1, as well as on all subsequent days of the battle of Mukden. During the daytime on March 1 the fire was so heavy that it was impossible for the train of the Eighth Division to get near the firing line, so it was parked at Heikoutai, and at nightfall a part of it advanced on the field right up to the troops which secured needed supplies from it.

On March 1 the headquarters of the Eighth Division was located on a large sand hill to the west of Heikoutai, immediately across the river in front of that village. A bridge had been built here by the Japanese, but the river was hard frozen everywhere. The division chief surgeon, his assistants, and the commander of the sanitary company of the division were all on this hill, so the first-named officer was able to direct the commander of the company personally. Good telephonic communication had been established between the hill and the medical department organizations of the division. So far as noted, all the troops of the division had their full complement of medical personnel, though but three field hospitals were on duty with it during the battle of Mukden; the additional personnel detailed at sanitary companies has been mentioned elsewhere. The establishment of a temporary dressing station was observed at 2 p. m. about 1,500 yards in front of the headquarters hills. The shell fire was very heavy at this time, in fact, heavier than it had been during most of the earlier part of the day, as some reenforcements were advancing to the aid of the left of the division. A nurse went out in front of these troops waving a Red Cross flag, which he finally placed in a tree at a distance of about 800 yards from the firing line. The station was then located immediately to the rear of this tree. There is a small stream which crosses the field here, so that the station had some protection from fire under the bank, though it was but poorly sheltered. As may be seen from the map, the station was right in the line of heavy artillery fire. Two surgeons, the battalion chief nurse, and two nurses remained in the station for some time after it was located, while all the battalion company bearers were employed in bringing wounded from the firing line when slackening of fire permitted them to do so. They used the litters of the battalion for this, but the greater number of

wounded men who arrived at the station walked back to it. Wounded received at this station remained there till night-fall, as it was not possible to reach them from the dressing stations nor for them to cross the field to the latter.

Little was done for wounded here; some dressings were applied and others were readjusted, and diagnosis tags were attached to the coats of wounded men. The supplies of the station consisted of those carried personally by the men and those from the chests transported on the battalion pack animals. It should be noted that the litters were brought up in the same manner. It is difficult to see how litters and medical supplies for any troops can be taken to the near vicinity the firing line except on pack animals or possibly on special carts.

I am indebted to Medicin-Major Martignon for the following description of a temporary dressing station which he visited on March 1, at the Fifth Division:

"This station, which belonged to the Twenty-first Regiment, was visited at 11.30 a. m. It had been established about one hour when the regiment began to move to the front. It was located under the bank of a small, dry stream, which had been trenched by the Japanese infantry. It was well protected from bullets and shrapnel, but not from explosive shells. It was about 200 yards to the left and in front of two or three Japanese batteries, which have been shelled since 7 a. m. by the Russians. During the hour that I spent here all the patients who arrived walked in except one man, who was carried on a litter. One surgeon and two nurses were on duty at this station. There was a decided lack of order in the station, but the medical personnel on duty attended patients very quickly. The blood was sponged off wounds, and a dressing of gauze and a bandage was applied. There was no water, and considerable carelessness was manifested in permitting the handling of wounds. Wounded who had already been attended assisted in caring for later arrivals. Wounded were not given diagnosis tags here. Wounded able to walk were sent further to the rear as quickly as possible, but those not able to do so easily were retained in underground shelters, which had been prepared by the troops to protect them from shrapnel fire. One surgeon was wounded in the station, and a soldier walking back to it received a

shrapnel bullet in the thigh after he had gotten very close to the station. The supplies were two chests."

As will have been seen, these two stations, which are quite typical of all such organizations, were located without reference to artillery positions. While this was, of course, a decided disadvantage, it is difficult to see how battalion surgeons can take account of artillery in choosing sites for such stations.

Before the Eighth Division engaged the enemy on the morning of March 1, the first half of the sanitary company was located at Heikoutai (4a) and the second half at Erchiahotzu (14). The first half was established in a number of Chinese houses on the east bank of the Hun River. Its operations were directed by the commander of the sanitary company, who, as has been noted, was on the sand hill but a short distance in front of it. A number of detachments—bearers—went out from this station to the field. Immediately in the rear of the sand hill eight litter squads consisting of four Chinamen each, two squads under the command of a Japanese bearer were posted while other squads went out farther. The fire was so heavy, however, that these squads could not cross the field to the temporary dressing stations, so they succored men coming back on foot who were unable to walk farther, and removed wounded coming back on sleds on the river Hun from the other dressing station. The high bank of this stream gave some protection from fire. The sleds were the ordinary sleighs which the Chinese use to carry their plows to the fields. They are rude affairs, but they were fairly easy riding on the surface of the frozen river and saved two bearers, as two Chinamen could carry a patient on them instead of the usual four. All bearers carrying litters bore them on their shoulders. Many of the litters seen in use on this day had no legs, though this was not the common type of litter in use in the field. The first half of the sanitary company carried about 40 patients to the station from the field, and about an equal number of wounded walked back to it from the field. Not far from the same number came down to the station by sleds on the river.

This station was not exposed to heavy fire, but it was hardly far enough to the front as the Japanese advanced to

not to advance from his trenches, but to contain the enemy to his front, and that if attacked he was to hold his position to the last man. All troops passed the night in their positions. Army headquarters were at Koutzuyen (21) and the reserves at Tatai (16) and Kinchentzu (17).’”

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Just how far toward the front the Japanese brought their division medical supply depots in preparation for the battle is unknown, but it is probable that one such depot was in the vicinity of Langtungkou (10) and another not far from Liaoyang. As has been mentioned, however, they did not depend to a large extent on supplying their divisional, line of communication and field medical organizations during the battle, but rather on loading them down heavily before the action commenced, only holding the depots in readiness to furnish extra supplies in case those issued by them previously were exhausted.

The increase in these supplies at Mukden consisted mainly of litters, blankets, food, forage, and surgical dressings (the field hospitals, for example, had 1,200 blankets at that battle and each half of a sanitary company had at least 90 litters.) The Sanitary Reserve Personnel, the field hospitals, and the sanitary companies each had about five times the regulation amount of supplies. Those of the transport departments for patients were not greatly increased, except the litters and blankets, and from 8 to 10 litters were carried by each battalion on its pack transportation. It was, of course, necessary to increase largely the amount of transportation in order that these additional supplies might be carried by the various medical department organizations. Each half section of a sanitary company was, therefore, given six Chinese carts in addition to its regulation allowance of transportation, while each field hospital had ten such carts additional, and each battalion had an extra pack animal for medical supplies. The Sanitary Reserve Personnel units also had their transportation proportionately increased. During the course of the battle even more transportation was occasionally hired from time to time by these organizations when it was needed. Coolies were also freely hired as required. These men, when employed by sanitary companies, received 2 yen per day on account of the extra hazardous nature of their work, instead of their regular rate of pay, which varied from 60 to 80 sen. Each Sanitary Reserve Personnel had hardly more than twelve coolies in addition to the drivers of their hired carts, but the transportation department for patients, at times, had hundreds in service. The number of

" *March 2.*—Yesterday's attacks had all failed, the losses in the Fifth Division had been very heavy, and we were still in doubt as to how and when our efforts would prove successful, but at 2.50 a. m. we received information from Akiyama that the Third Army had occupied Ssufangtai (46) at 10.30 p. m., and that the enemy had retired north-east. The left wing of the Third Army had also occupied Yangtzukngtzu and driven the enemy northwest, also that a cavalry detachment of the Third Army had occupied Tamintun and that the Third Army intended to press the enemy's right flank and advance to Linchiatai and Lamuhö.

" That part of the Fourth Division which was attacking the enemy's redoubt west of Peitaitzu (34), viz. one brigade (less one battalion) under the command of Major-General Hayashi, made a night attack at 2 a. m. and occupied the redoubt, but we were driven out again; we attacked again immediately, but were repulsed, but made a final assault and took the redoubt at 4.30 a. m. The enemy left 350 dead on the ground and 30 prisoners, and retired to Kuchiatzu (23), where they rallied and took up positions. Some of them, however, retired to Peitaitzu (34). The first time that we took the redoubt we captured several prisoners, and were getting them together when the enemy attacked us and drove us out; the hand-to-hand fighting inside the redoubt was terribly severe.

" Snow fell on the 2d of March, which was the coldest day of the battle [this is a slight error], and greatly impeded the movements of the troops.

" The troops facing Wangchiawopeng (39), seeing signs of the enemy retreating, rushed the village and occupied it at 5.30 a. m. Those at Lichiauwopeng (38) occupied that village at 7.30 a. m. and followed the enemy up as far as Chiutsaihotzu, who retired to Shoukuanpu (24), and to the right bank of the river Hun.

" The main body of the Eighth Division on the right bank of the river Hun sent a reconnaissance to Changtan (2) in the early morning and found that the enemy had just retired, so they seized the village; the main body of the division followed up, occupied the village, and pursued the enemy.

" Part of the divisional artillery shelled Nienyupao at 8

a. m. and infantry rushed the village and found that the enemy had just retired. The battalion of infantry of this division which had been on the left bank of the Hun now marched to the northern corner of Changtan (2) and joined the main body.

"At 9.30 a. m. the army commander issued the following orders:

"(1) The army will advance through the district west of the river Hun and press the enemy to the northeast.

"(2) The Fifth Division will advance to Shoukuanpu (24) and reconnoiter the enemy at Wanchutai (61), Tapantai (52), and Hsiaohantai (53) as soon as all preparations are complete.

"(3) The Eighth Division as soon as it is ready will advance toward Tontaitzu (22) and Matonlu (56). It must keep in touch with the Third Army under all circumstances.

"(4) The Fourth Division, as soon as it is ready, will advance to the line from Hsinliantun (31) to Kuchiatzu (23) and reconnoiter enemy's condition at Yangshulintzu (58) and Wanputzu (59).

"(5) The heavy artillery brigade will assemble at the southwest corner of Chentanpu.

"(6) The general reserve of the army will proceed at once to Chentanpu (3).

"(7) All divisions will take steps to follow up the enemy in obedience to the above orders."

"That morning, shortly after our troops had taken the redoubt west of Peitaitzu (34), they took the village of that name also, and seeing the enemy showing signs of retreating they rushed the village of Huanchi (35).

"The part of the Fourth Division, which was near Yapa-tai (4), seeing the enemy retiring from Huanchi (35), attacked Hsinshantun (31) at 2.30 p. m., and completely occupied the village. The brigade under General Hayasahi now attacked the village of Kuchiatzu (23). The Thirteenth Regiment of Artillery took up a position west of Peitaitzu (34) in order to assist this movement and bombarded both Kuchiatzu (23) and Shoukuanpu (24); the former was taken at 6 p. m., and the enemy retired north in disorder. The troops took Erhtaitzu (37) at 7 p. m. That

part of the Fourth Division which was holding trenches form Litajentun (14) to the left of Tomioka's detachment (i. e. the Thirty-fourth Regiment of the Third Division) seeing the other wing so successful went on and captured Fuchiachuang at midnight. The pursuing troops of the Fifth Division, viz, one battery of artillery and one regiment of Infantry under General Sulosowa, were fired on heavily from Shoukuanpu (24), but were reenforced from the division at 5 p. m., drove the enemy out, and occupied the village.

"The Eighth Division after taking Changtan (2) advanced to Hochuangtzu (51) divided into two columns, pursued the enemy, and before sunset occupied Wanchutai (61) and Hsiaotiputzu (62)."

The Eighth Division was not really engaged on March 2 after the very early morning, except two batteries, which assisted the Fifth Division in its attack on Shoukuanpu, which was a much heavier fight than is indicated in the Japanese report.

"No great change took place during the day in Tomioka's detachment, but at night, seeing that several villages were in flames, and taking it to be a sign that the enemy were retiring, they shelled them heavily, but found that the enemy was still in its old positions. Akiyama's detachment after being transferred to the Third Army went far northwest. The right wing of the Third Army occupied Peisantaitzu and Hsiaotaitzu. Information was received that heavy fighting was going on in front of the Fourth Army and that the enemy was resisting stubbornly. At 9.30 p. m. the following orders were issued:

"(1) The army will continue the pursuit on the 3d inst. (next day) and press the enemy toward the northeast.

"(2) The Fifth Division will leave its present position at 6.30 a. m. and advance the line from Tachuangho (65) to Hsinkaiho (66), but will leave one and one-half battalions in Shoukuanpu (24) to join the general reserve of the army.

"(3) The Fourth Division will leave its present line from Hsinshantun (31) to Kuchiatzu (23) at 6.30 a. m. and advance to the line from Huakatai (67) to Tachuangho (65), keeping to the east of a line from Tachuangho (65) to Tapanantai (52) exclusive.

“(4) The Eighth Division will leave its present quarters at Wanputzu (54) at 6.30 a. m. and advance to a line from Hsinkaiho (66) to Waichiapu (70) and occupy it. Their line of advance will be west of a line drawn from Shochiawopeng (71) to Hsinkaiho (66), including the right bank of the river Hun and the village Hsinkaiho (66), but excepting the village of Shochiawopeng (71); it will keep touch with the Third Army.

“(5) General Tomioka will remain in his present position, but when the other divisions advance he will bombard the enemy to his front and assist their advance.

“(6) The heavy artillery brigade and the general reserve of the army will assemble south of Chentanpu (3) at 6.30 a. m.”

So far as the medical department of the Eighth Division was concerned not many new wounded required care on the 2d of March, so that its efforts were principally devoted during that day to providing for those of the preceding day and night. So far as known, the dressing station established by the first half of the sanitary company at Toutaitzu (20) did not receive a great many wounded. Those succored there were evacuated into the Second Field Hospital at Heikoutai (4A), as well as were the many wounded in the dressing station of the second half of the sanitary company at Erchiahotzu (14). This dressing station was able to free itself of wounded and to pack up early in the afternoon of the 2d, when it moved forward with all its transportation. Most of the wounded from it went first to No. 2 Field Hospital at Heikoutai, where some of them were retained and others were sent to No. 1 Field Hospital, which had been opened early in the morning at Sumapu. Some wounded, however, were sent direct from this dressing station to Field Hospital No. 1. Hence they were evacuated by the transport department for patients to Langtungkou (10).

A great many of the wounded who were being brought back to the field hospitals on this morning were on Chinese carts. Two to four men were placed on a cart, according to the seriousness of their wounds. Seven hundred and ninety-one wounded had been received at No. 2 Field Hospital by 11 o'clock in the morning, three of whom had died. This does

not represent the total number of wounded from the division, however, for, as stated, some of these men went direct to Field Hospital No. 1.

Field Hospital No. 2 was busily occupied in caring for the great number of patients then under treatment there. Seven kettles had been set up in the yard used as a kitchen. Here soup was being prepared from the Japanese canned beef, rice was in process of cooking, and Japanese preserved plums were being issued. Another food which was supplied in large quantities was pork, for which a great many frozen pigs, purchased from the Chinese, were stored in the yard of the kitchen compound. About half a dozen Chinese coolies were employed in the kitchen. In the operating room, which was now as clean as it could be made, with a canvas stretched above the operating table to prevent dust from falling on it, mats on the floor, etc., a great many extensive dressings were being made. The surgeon in command of the hospital stated that when the weather was not too cold he always preferred to use a tent for operating, rather than a dirty Chinese house. He was making all dressings, aided by six nurses. The technique was only fair. All wounds which I saw dressed had previously received attention at the dressing station. Too little material had been used at this station, so many dressings were soaked through. The wooden coaptation splints had not proved very satisfactory either, as they were too short for many cases. It was impossible to ascertain even approximately the proportionate number of shell, rifle, and other wounds, but it was stated that there were a great many wounds from shrapnel, and this was borne out by personal observation. The object pursued in dressing these cases was not in any way to give them definite treatment, but only to care for them so that they could bear transportation further to the rear. It is supposed that the transport department for patients began its work sometime in the afternoon.

The Fifth Division was heavily engaged on the 2d, but no special features in regard to its medical department require mention.

Location of dressing stations and hospitals, March 2.

	Fifth Division.	Eighth Division.
Dressing stations:		
First half of sanitary company-----	Erchlahotzu-----	Toutaitzu.
Second half of sanitary company-----	Liutiaoko-----	Erchlahotzu.
Field hospitals:		
No. 1-----		Sumapu.
No. 2-----	Kinchentzu-----	Helkoutal.
No. 3-----	Hsiaotientzu-----	
No. 4-----	Kinchentzu-----	
Stationary hospitals:		
Liutunkou-----		
Shantaitzu-----		
Line of communication hospital:		
Langtungkou-----		

March 3.—The Fifth Division left its quarters at Shoukuanpu at 6 a. m., and its left wing, consisting of one regiment of infantry and one of mountain artillery, under Major General Saliswa, occupied the village of Shochiawopeng (71) at 7 a. m., repulsed the enemy who were holding east and south Tontaizu (22), and went on to Matunlo (56) and arrived in front of Tawangkanpu (72), east of Matunlo, at 9 a. m.

“The right wing of this division, consisting of one battalion of field artillery and two and one-half battalions of infantry, in its advance drove back small parties of the enemy, and at 9.50 a. m. arrived at Hsintaitzu (73), and in conjunction with the left wing attacked Tawangkanpu (72) and drove the enemy northeast.

“The left column of the Eighth Division left Hsiaotiputzu (62) and arrived at Waichiapu (70) at 11 a. m. The right column left Wanchutai (61) at 6 a. m., and proceeding along the left bank of the river Hun crossed it south of Litaku (75) and joined the left column.”

It will be noticed that at the end of the day the entire Eighth Division was advancing on the right of the river, while the Fifth Division was still on the left bank.

“The right column of the Fourth Division, consisting of four battalions of infantry (of which three belonged to the Thirty-fourth Regiment of the Third Division) and one battery of artillery, left Paohsiantun (57) at 5.20 a. m. and at about 8 a. m. joined the left of Tomioka's force and occupied Peilintai (76). The left column of the Fourth Division left

east Hsiaohantai (53) at 6 a. m. (it consisted of five battalions of infantry) and pursued the enemy. The artillery of this division changed its position from time to time and covered the advance of both columns. This artillery included the Thirteenth Regiment of Field Artillery.

"Army headquarters left Koutzuyen (21) at 9 a. m. and came on to Chentanpu (3). General Oku issued the following orders at 11.30 a. m.:

" (1) The army will continue the pursuit to-morrow and advance to the line from Hsiaokou (77) to Tuinando (78).

" (2) The Eighth Division will keep touch with the right wing of the Third Army and advance to the line from Tuinando (78) to Hsiachi (79).

" (3) The Fifth Division will advance to the line from Sualpu (80) to Suliandampu (81). The area of their operations is west of a line drawn from Tachuangho (65) through Inerhpu (83) to Sualpu (80), all inclusive.

" (4) The Fourth Division will advance from Hsiaokao (77) to Sualpu (80), and their area of operations will be east of Tachuangho (65), Inerhpu (83), and Sualpu (80), exclusive.

" (5) When the right wing of the Fourth Division passes Yenchiataitzu (85) that part of Tomioka's detachment opposite Tamuchinyen (40) will attack the enemy at that place, but the remainder of the detachment will stand fast on the old line.

" (6) The general reserve will proceed at once to Hsiaohantai (53).'

"All the divisions advanced in accordance with the above orders, and the Fourth Division before sunset occupied a line extending from Sanchiatzu (86), Hsiakou (77), and Hoanchi (84).

"The Fifth Division occupied a line from west of Inerhpu (83) to Suliandampu (81).

"The Eighth Division, still holding its position near Wai-chiapu (70), connected up with the right wing of the Third Army.

"The night passed with our troops confronting the enemy at close distances. Army headquarters were at Hsintaitzu (73), and the reserve at Tapantai (52) and Hsiaohantai (53).

"The enemy in front of Tomioka's detachment kept to their old position, but the remainder occupied a line from Tamuchinyen (40) through Hsiaosholuitzu (88) and Pachiatzu (89) to Suhupu (87).

"The Third Army repulsed one army corps of the enemy on the 2d, and on the 3d occupied a line from Hsifanpu to Lamuho.

"Tomioka's detachment was unable to drive the enemy from Tamuchinyen (40) this day.

"General Oku issued the following orders at 11 p. m.:

"(1) The army will advance to-morrow to a line from Talientun (41) to Suhupu (87) and across to the right bank of the river Hun.

"(2) The Fourth Division will attack the enemy to its front, and advance to a line from Kuanlinpu (94) through Hsiaosuchiapu (95) and Mansuikuan (96).

"(3) Tomioka's detachment will await the result of the attack of the Fourth Division and will then advance its left wing and seize Tamuchinyen (40) and Talientun (41) through Chitaitzu (97).

"(4) The Fifth Division will attack at early dawn and take Suhupu (87).

"(5) The Eighth Division will assist in the attack of the Fifth Division and advance to a line from Suhupu (87) to Hsiaoyushupu (99), advancing along the right bank of the river Hun.

"(6) The general reserve of the army will march at 6 a. m., for Tachuangho (65).

"(7) Army headquarters will leave Hsintaitzu (73) and proceed to Tachuangho (65)."

On March 3, at 6.30 a. m., the Eighth Division headquarters advanced from Hochuangtzu, where the previous night had been spent. The Russians were retreating rapidly toward Mukden, and the sanitary companies had not been able to get up to the front. At least they were not with the column of which the division headquarters formed a part, which was well in advance. This only gave to the column the division surgeon, his assistants, and the medical personnel of the troop. The latter were not permitted to leave their organizations.

At about 11 a. m. we arrived at Shuangshutun, where a number of Russian wounded and some Japanese lay in the road and the trenches. These were collected in a couple of Chinese houses by some company bearers. They had received little attention at the time of our departure, at 2 p. m., and no medical personnel was available to remain with them. The division headquarters spent the night at Huchiayu.

Location of dressing stations and hospitals, March 3.

	Fifth Division.	Eighth Division.
Dressing stations :		
First half of sanitary company-----	Tachuanho-----	Toutaitzu.
Second half of sanitary company-----	Lichlawopeng-----	
Field hospitals :		
No. 1-----		Sumapu.
No. 1 (two-thirds)-----	Lichlawopeng-----	
No. 1 (one-third)-----	Sullupatal-----	
No. 2-----	Kinchentzu-----	Heikoutai.
No. 3-----	Hsiaotientzu-----	
No. 4-----	Kinchentzu-----	
Stationary hospitals :		
Sumapu-----		
Llutunkou-----		
Shantaitzu-----		
Line of communication hospital :		
Langtungkou-----		

March 4.—The right wing of the Fifth Division repulsed a strong force of the enemy, which retired northeast, and at 6.30 a. m. occupied Inerhpu (83).

The artillery of this division took up positions between Suhupu (87) and Suliandampu (81), and shelled the enemy, who were retreating along the right bank of the river, and assisted the attack of the Eighth Division. The remainder of the Fifth Division assembled at Changsupu (100), south of Suliandampu (81). The pursuing troops of the Eighth Division, viz, five battalions of infantry and one regiment of mountain guns, attacked a strong force of the enemy at Hsiachi (79), and captured the village at 8 a. m., followed up the enemy and at 11 a. m. took Hsiaoyushupu (99) and Tayushupu (101).

At 10 a. m. General Oku issued the following orders:

“(1) The army will advance from a line from the old railway bridge to Lukuantun (102).

“(2) The Fourth Division will attack the enemy in order to assist the advance of the Sixth Division and protect the

right flank of the army. Tomioka's detachment will be placed under the orders of the commander of the Fourth Division.

“(3) The Eighth Division will leave Hsiaoyushupu (99) and advance through Yulinpu (103) and Nienkuantun (104), and proceed to a line from the nameless village from west of Tapu (105) to Lukuantun (102) and keep up connection with the Third Army.

“(4) The Fifth Division will leave Suhupu (87) and advance to a line from the old railway bridge to Hsiaoshatotzu (106).

“(5) Tomioka's detachment will take its orders from the officer commanding the Fourth Division.

“(6) The general reserve will leave Tachuangho (65) at 11 a. m. under the orders of the brigadier-general commanding the heavy artillery and will proceed to Sulian-dampu (81).

“(7) Army headquarters will be at Tachuangho (65).’

“At 12.30 p. m. an order was received from Marshal Oyama that Tokioma's detachment and the Fourth Division were to be transferred to the Fourth Army.

“At 2 p. m. orders were issued to the Fifth Division to take one and one-half battalions of the Forty-first Regiment which had been in the general reserve, and use them to protect the army's right flank and keep up connection with the left wing of the Fourth Army.

“At 2.30 p. m. an order was received from Marshal Oyama that the Third Division was transferred to the Second Army. On receipt of this order this division, which was then at Hochuangtzu (51), was ordered to march to Tunando (78) and Hsiao-chingsuitzu (108) by sunset. Prior to this the first line of the Eighth Division occupied positions from Yulinpu (103) to Ninkuantun (104) by 4 p. m.

“Two battalions of infantry had reached Yulinpu and Nienkuantun, and two were in reserve at Soyaton (130), behind the railway embankment.

“It came under heavy artillery fire as well as infantry fire from Yangshitun (109) and Hsiaoshatotzu (106) and was enfiladed by artillery fire from Michiapu (110) south of the old railway bridge. The Eighth Division opened artillery and

infantry fire against the first two named places but darkness intervened.

"The Fifth Division in accordance with the orders of 10 a. m. leaving one company at Suhupu (87) and another at Tatai (112), to its south, crossed the Hun and marched against the enemy at Hsiaoshatotzu (106).

"When the advanced guard of this division (one regiment of mountain guns and one regiment of infantry) arrived at Tayushupu (101) the Eighth Division was heavily engaged with the enemy at Yangshihtun (109) and Hsiaoshatotzu (106). The first line of the Fifth Division deployed and advanced against the enemy holding a line from the old railway bridge to Hsiaoshatotzu (106) and its artillery opened fire from a position east of Tayushupu (101). The divisional commanders reenforced the advanced guard with one regiment of infantry, but the enemy resisted stubbornly and darkness came on without any result having been achieved. The left wing of the Fourth Division attacked the enemy in the morning who were holding Laishanpu (113) and seized the village at 1 p. m.. The loss of this village was a very serious one to the enemy, as it formed an important salient of their position and they launched three successive attacks against it, but all three failed.

"The right wing attacked Hsiaosholuitzu (88) and captured it at 2 p. m. The Fourth Division passed the night on the newly captured line. When the right wing of the Fourth Division seized Hsiaosholuitzu (88), the left wing of Tomioka's detachment captured Tamuchinyen (40) and connected up with the right wing of the Fourth Division.

"Army headquarters moved to Waichiapu (70) and the general reserve to Suliandampu (81), and at 10 p. m. the following orders were issued:

"(1) Fifth and Eighth Divisions will continue to attack to their front.

"(2) Third Division will assemble near Tunando (78) by 7 a. m.

"The general reserve will assemble at 7 a. m. at the west corner of Waichiapu (70)."

Early in the morning the Eighth Division, advancing, met the enemy between Waichiapu and Totaizu at a little village

called Hsiachi. This they took at 8 a. m. The first half of the sanitary company had passed division headquarters in the night or early morning and established a dressing station at Waichiapu. A surgeon and some fifteen men had been left on the road to care for the wounded at the various points there.

This dressing station presented few peculiar features worthy of record here. It was well up toward the front; so much so that it was at one time exposed to rifle fire and all during the engagement to considerable shell fire. So far as observed, but one man was wounded in its compound. It was noticed that the engineers were using company bearers here. The extreme care taken to bring in men dying en route to the dressing station was noted. On arrival, the property of all such men and of helpless wounded was taken in charge by a noncommissioned officer of the intendency department, and a record was made of it in the presence of two or three other men. This station was established at about 7 a. m., and it was closed at 11, a surgeon, a chief nurse, and about six nurses being left behind to care for the patients until they could be transferred.

Though the station is not recorded on the map, on arrival at Totaitzu, at about noon, one was opened for a short time to collect wounded in that town. Here also it was necessary for the sanitary company to leave a few men behind to care for the wounded temporarily. On leaving this village, the first half of the sanitary company assumed its regulation position in rear of the division. On account of losses by casualties and by leaving personnel on the road to care for patients at this time, it was but 170 strong, and had but 11 pack animals—4 with chests, 4 with litters, and 3 with miscellaneous articles and officers' baggage.

The division headquarters remained at Hsiaoyushupu (99) that night.

It will be noticed, by referring to the table of medical stations, that No. 1 Field Hospital of the Eighth Division was established in Waichiapu on this day. This of course solved the question of the care of men wounded during the Japanese advance.

Location of dressing stations and hospitals, March 4.

	Fifth Division.	Eighth Division.
Dressing stations:		
First half of sanitary company-----	Tachuangho	Waichiapu.
Second half of sanitary company-----	Lichlawopeng	Tayushupu.
Field hospitals:		
No. 1 (two-thirds)-----	do	
No. 1 (one-third)-----	Sullupatal	
No. 1 (one-half)-----		Waichiapu.
No. 2-----	Kinchentsu	Heikoutai.
Stationary hospitals:		
Sumapu-----		
Llutunkou-----		
Shantaltzu-----		
Kinchentsu-----		
Line of communication hospital:		
Langtungkou-----		

March 5.—The Fifth Division attacked the enemy at Hsiaoshatotzu (106) in the early morning. The battalion of independent field artillery and heavy guns took up position north of Hsiayushupu (99), and the regiment of mountain guns on the hill southeast of Tayushupu (101) to cover this attack. The first line of the Fifth Division—that is, the main part of the Ninth Brigade—advanced to attack Hsiaoshatotzu (106) from the district on the right bank of the river Hun against the old railway bridge and the southwest of the village north of Machiapu (110). The first line of the left wing—that is, one regiment—captured the old railway embankment at 7 a. m. The enemy facing us consisted of about one division, with 60 guns. Some of his infantry was holding south Machiapu (110), and in our advance we had to sustain a very heavy fire from this direction on our right flank and rear, and our attack failed.

“The right wing of the Eighth Division, consisting of three battalions of infantry, attacked in its front from the direction of Yulinpu (103) and came into close touch with the enemy, while the main body of the division, eight battalions, advanced against them at Yangshihtun (109), but the latter resisted very stubbornly, and the sun set without our having gained any result.”

The first fight here was in the early morning of the 5th of March. The division commander desired to attack Yangshihtun and Tukuantun with his troops in advance, but the battalion advancing from Yulinpu were so heavily shelled

by some 60 Russian guns that they were unable to advance, and the left could not make the attack alone. Again, at 2 p. m., a regimental commander in Nienkuantun, contrary to orders, made an attack on his front, and the division commander was obliged to order a general attack in order to save him. During this the reserves had to be sent from Soyatun to Nienkuantun to hold the latter village. Another attack, which was also checked, was made here on the night of the 5th.

"Army headquarters was at Waichiapu (70). At 8 a. m. that day an order was received from Marshal Oyama that the Second Army was to extend its left wing as far as possible in order to free the Third Army to press the enemy from the northwest.

"Information was received at 8 a. m. from the Third Army that it was going to march northward, whereupon General Oku issued an order to the Third Division, which was then at Tachingtsuitzu (115), to march with all possible speed to the line now held by the right division of the Third Army (the Ninth), and to relieve them on that line and guard our front from opposite Yangshihtun (109) to Houmintun (116) and to attack the enemy holding Yukuantun (117).

"The Third Division marched in accordance with the above order, but by the time that the Third Division had been relieved the sun set, and the Third Division passed the night at Changshitun and Houmintun (116).

"At 4 p. m. the main body of the heavy artillery was transferred to the command of the commander of the Eighth Division, and took up a position by night near Tayushupu (101). One regiment of heavy artillery only went to the Eighth Division and the other regiment remained with the Fifth Division.

"During this day the Fourth Division took up a line from Wenshimpu (119) through Yatisuyu (120), Tasuchia-pu (121), and Mansuikuan (96) against the enemy on the railway and at Hsiaokishipu (122), Takushimpu (123), and Peitaizu (124).

"During this day a part of the Fourth Army occupied Michialatzu and Wanchiakuchiatzu.

"At 9 p. m. General Oku issued the following orders:

"(1) Every division will continue the attack to-morrow and try its best.

"(2) The general reserve will leave Waichiapu (70) at 6 a. m. and proceed to Soyatun (130)."

The Japanese had now come in contact with the Russian forces actually at Mukden, and the medical service at the front was in many respects performed under even greater difficulties than those encountered during the preceding days of the battle.

The Japanese forces having been checked, it was not, of course, so hard for the field medical organizations to keep in close touch with the troops, but there were many more wounded to care for and it was more difficult to reach them, as they fell so near the Russian lines. The latter also had a great number of guns, so the zone of heavy fire through which the wounded had to pass was a wide one. This resulted in making the night work of the medical department very heavy, comparatively few wounded being brought or walking to the dressing stations by day.

The first half of the sanitary company established its dressing station in an advance position at Hsiaoyushupu on the 5th. Though the personnel exposed itself freely all day it had only been able to collect about 200 wounded by nightfall. The site chosen for this station was a particularly bad one, as it was immediately in rear of a Japanese mountain battery, which was engaged all day with several Russian field batteries, which had a much longer range, so that the station was never safe from fire. The exact number of its casualties could not be learned, but at least 1 surgeon was wounded in it and 1 man was killed and 3 wounded. In the near vicinity of the station bodies covered the ground. While the situation was not a good one, probably no better one could have been found near the front; it was not much over 4,000 yards from the nearest Russian artillery. Not more than 4 surgeons and 100 men were on duty in this station. The half company manning it had felt the want of litters badly during the previous days of the battle and now had 105 on hand, including many improvised from Chinese curtain poles with a netting of rope for the bed. This sta-

tion was moved to Nienkuantun during the night of the 5th.

So far as observed very few wounded went back from this station to a field hospital during the day. No. 3 Field Hospital was opened toward evening in Tehsiangyintzu, and a great many wounded arrived there during the night. They came both from the dressing stations and directly from the troops.

Location of dressing stations and hospitals, March 5.

	Fifth Division.	Eighth Division.
Dressing stations:		
First half of sanitary company-----		Hsiaoyushupu.
Second half of sanitary company-----	Hsiaoyushupu.	Tayushupu.
Field hospitals:		
No. 1 (one-half at each)-----		Walchiapu.
No. 1 (two-thirds)-----	Lichlawopeng.	Chantalpu.
No. 3-----	Hsiaoyushupu.	Tehsiangyintzu.
Stationary hospitals:		
Sumapu-----		
Liutunkou-----		
Shantaitzu-----		
Kinchentsu-----		
Line of communication hospital:		
Langtungkou-----		

"March 6.—Two battalions of infantry under General Muriana (the Fifth Division) deployed in the early morning and opened fire in concert with the right wing of the Eighth Division. The right wing of the Fifth Division (one brigade of infantry with a few engineers), under General Sulisawa, connected with the left wing and advanced against the enemy at South Machiapu (110). The regiment of mountain guns pushed up as far as the old railway bank. Our infantry opened fire at 7.20 a. m. and artillery at 9.50. The enemy replied, and a heavy bombardment ensued. The greater part of our heavy artillery fired on South Machiapu (110) and Hsiaoshatotzu (106). Our infantry advanced under cover of our field and mountain guns, our left wing was exposed in right flank and rear to both infantry and artillery fire, and we suffered heavily, but pressed on and at 2 p. m. arrived at the nameless village north of South Machiapu (110). At 4 p. m. a part of the enemy began to retire, and our infantry and artillery fired heavily upon them, but its main body still held on to the village and resisted so stubbornly that we were unable to

take the village and passed the night in our position. The battalions of the Twenty-first Regiment were holding a line on the left bank of the river Hun from Suhupu (87), confronting the enemy at Erhtaitzu (131). These were now handed over to the Third Division. It may be thought that if these regiments had pressed on to Machiapu (110) they would have helped the Third Division, but we had ascertained before that South Machiapu (110) had been placed in an extremely strong state of defense and that it would be impossible to take the village with so few men. The Eighth Division took up the same line as yesterday with its heavy artillery in position north of Hsiaoyushupu (99) and its field guns across the old railway embankment and opened fire against Yangshihtun (109), Tukuantun (132), and the nameless village southeast of Yangshihtun (109). The right wing of this division was at Yulinpu (103), exchanged infantry fire with the enemy, and at 2 p. m. made an assault against the enemy. Previous to this the Thirteenth Regiment of Artillery had been ordered to rejoin the Eighth Division from the Fourth Division, and took up position on the east of the village of Soyatun (130) and fired against Yangshihtun (109). The attack of the right wing of the Eighth Division was, however, unsuccessful, the Russian works were exceedingly strong, and our men lost heavily by fire from Hsiaoshatotzu (106) and South Machiapu (110) and were checked within a short distance of the enemy and remained there. The left wing of this division also assaulted the works in its front, but were similarly checked. The division commander ordered them to hold on to the positions they had gained and to assault again at night."

The Japanese had meanwhile received additional guns till they had 100, which was equal in number to those of the Russians opposed to them.

"A report was received at this time from the Third Army that their turning movement had been successful, they were in close touch with the enemy, and that severe fighting was going on. Our reconnoissances showed that the enemy was holding a strong line from Yukuantun (117) through Yangshihtun (109) and Hsiaoshatotzu (106) to South Machiapu

(110), and that they were on their last line of defense works covering the west of Mukden. The commander of the Second Army therefore determined to continue attacking the enemy as hard as he could, because the more we attacked the greater number of the enemy we drew on to us and kept in front of us and therefore helped the Third Army.

"The Third Division deployed two battalions of infantry near Changshitun, about 800 meters east, and the Fifth Infantry Brigade took up its position at Likuanpu (133) and the divisional artillery northeast of Changshitun and reconnoitered the enemy's position. We ascertained that the enemy were holding a strong position near Yukuantun (117), and the division commander, considering that it would be unwise to attack it by day, made plans for doing so in the early morning. The army headquarters passed the night at Hsifanpu and the general reserve at Soyatun (130). The Thirty-fourth Regiment of the Third Division, which had been temporarily attached to the Fourth Division to hold part of the original line on the Sha River, was ordered to rejoin its proper division after the Fourth Division had been handed over to the Fourth Army, and was now on its way to do so, and one battalion arrived at Soyatun (130) on the night of the 6th and joined the army reserve, bringing up the strength of the latter to three battalions.

"During this day the Fourth Division was holding its own old position. At 9.30 p. m. information was received from Manchurian army headquarters that two battalions of Kobe infantry would be handed over to the Second Army; these battalions were then at Yachikang and a message was sent to them by an officer to say that they were to leave quarters at 7 a. m. and march to Changshitun."

As was stated in discussing the medical department yesterday, on the night of the 5th the first half of the sanitary company of the Eighth Division went to Nienkuantun. On arrival at that village it was given the best available site there for its dressing station. This was in some Chinese houses to the north. The whole village, however, was exposed to incessant heavy fire from a number of Russian batteries, not only from field guns, but also to eight 15-centimeter guns firing explosive shells, which constantly set fire

to houses. There is no desire to criticise the position of this dressing station at Nienkuantun, for, as a matter of fact, no better site could have been selected for it. The work of the station was, however, performed with difficulty, and was necessarily carried on in great part during the hours of darkness, when men were succored by the bearers and brought to the station, afterwards being sent back to the nearest field hospital before the Russian fire began in the morning. Some few wounded men, of course, filtered into the station during the day, but no attempt was made to send wounded men from it to the rear until after nightfall. That is, on the 6th, on later days of the battle, a few wounded from Nienkuantun did reach the field hospital in advance by day.

Bearers by night could rarely use their lanterns when in attendance on wounded in front of the station, but between station and field hospital it was possible for them to have this light. Between Nienkuantun and Tehsiangyintzu, where the advance field hospital of the Eighth Division was located, a plain almost without shelter, about 3 miles wide, intervened. On account of lack of other personnel, it was necessary to use Chinese bearers extensively between this dressing station and field hospital. Their work was superintended by Japanese bearers in the proportion of one to four litter squads. All litters were carried on the shoulders here.

Field Hospital No. 3, established at Tehsiangyintzu at 4.30 p. m. on the night of the 5th, had received about 600 patients by the next morning. This field hospital was very well located just beyond the range of the Russian artillery, only a few shells striking near it during the time it was open. On the 6th, as some mountain batteries appeared about to take position near it, the surgeon in command was apprehensive that he might be compelled to move and actually went to another village about a mile away to seek quarters for the hospital, but as the new village was much more exposed to fire than the old one, he did nothing further, and, fortunately for his wounded, the Japanese batteries finally moved away. The village in which this hospital was located was a very small one, however, not affording enough houses for the good shelter of many wounded men, and the buildings available were not good structures. Many of the cases ad-

mitted during the night of the 5th and the morning of the 6th were dressed immediately, so that very little work was in progress at the hospital during the latter day, nor were more than very few patients being sent to the rear. Early in the morning of the 6th this hospital was in telephonic communication with division headquarters and with Nienkuantun, but later in the day the wire was removed.

Location of dressing stations and hospitals March 6.

	Fifth Division.	Eighth Division.
Dressing stations:		
First and second halves of sanitary company	Hslaoyushupu	
First half of sanitary company		Nienkuantun.
Second half of sanitary company		Tayushupu.
Field hospitals:		
No. 1 (one-half at each)		Waichlapu.
No. 1 (two-thirds)	Lichlawopeng	Chantalpu.
No. 3	Hslaoyushupu	
No. 4	Chantalpu	Tehsiangyintzu.
Stationary hospitals:		
Sumapu		
Llutunkou		
Shantaitzu		
Kinchentzu		
Line of communication hospital:		
Langtunkou		

March 7.—Both wings of the Eighth Division made a night attack, the right wing from the southeast of Yulinpu (103) against Tukuantun (132) and the left wing from the north of Nienkuantun (104) against Yangshitun (109). The enemy's defenses, inside strong works or behind the village walls, and surrounded with obstacles, were too strong for us and the attack failed and our men fell back to their own positions."

The left wing lost its way and only arrived at Yangshitun at daybreak, and was checked with 700 casualties out of a force of 1,400. This was the last attack on these strong positions. The forces did not, however, as would be understood from the Japanese report, quoted above, retreat to their original positions. They actually remained from the night of the 4th till the night of the 7th behind sand bags in front of Yangshitun and Tukuantun. The ground in front of these villages is very flat. Yangshitun was especially strong, and the ground is so flat there that there is

no protection except at the north, where there is a Chinese graveyard and a few trees. This village had a strong redoubt and wire entanglements. At the north, where there was some protection, the Japanese got to within about 200 yards of the Russian position and to within about 600 yards on the remainder of their line, attacking the village. At Tukwantun there is a depression in the ground on first leaving Yulinpu, which gave some poor shelter to advancing troops, so that the Japanese were able to get within about 250 yards.

On the night of the 4th the Eighth Division had three mountain batteries in position to the south of the railroad and five batteries of field artillery to the north of the railroad. On the night of the 4th one mountain battery was sent to Yulinpu and one to Nienkuantun. On the early morning of the 5th, or on the night of the 4th, the remaining battery of mountain artillery passed to the north of the railroad. On the evening of the 5th the Eighth Division was reenforced by heavy artillery, consisting of twelve howitzers, 15-centimeter. These were placed on a small hill to the south of the railroad. On the 6th six 6-centimeter mortars were sent to the same point, and on the same day at 3 p. m. a regiment of field artillery was sent to Soyatun as a further reenforcement.

"The Fifth Division advanced as close as was possible to the enemy and remained facing the enemy. At noon sixteen field guns appeared northeast of Erhtaitzu (131) and shelled our front line and were engaged by our heavy and field artillery. Previous to this, orders had been issued at 6 a. m. for one battalion of the Thirty-first Regiment to return to the Eighth Division.

"Before dawn the Third Division attacked the enemy at Yukuantun (117); the right wing of this division demonstrated against the enemy from the position it had taken up 800 meters east of Changshitun, and with General Nambo's brigade attacked Yukuantun (117). Two battalions of the Thirty-third Regiment attacked the three houses, and two of the Sixth Regiment the village of Yukuantun (117) itself, on its southern corner. Both attacks were successful, but the enemy still held on to the northern half of the village,

but we drove them back step by step, and at 8.40 a. m. had occupied the whole of the village. The Russians were then strongly reenforced and we were obliged to retire on the southern half, which we determined to hold to the last. Re-enforcements kept pouring in to the enemy and a terrific fight went on inside the village, but at 2 p. m. the Thirty-third Regiment, which was being fired upon in flank and rear from the redoubt south of the three houses, and also from three batteries of artillery northeast of Yukuantun (117), and attacked in strength from the east, still managed to hold on to the three houses in spite of heavy losses until 2 p. m. Two battalions of infantry had in the meanwhile been sent up to reenforce, and our infantry had been firing against the enemy's guns from 8 a. m., but the latter's positions were artfully concealed in a ravine and our guns had little effect on them. At 2 p. m. the enemy received reenforcements of seven battalions of infantry and attacked with the whole force, and the Thirty-third were obliged to retire from the three houses.

"With the loss of the three houses our men in Yukuantun (117) were exposed to fire from the north, east, and the south, but managed to hold on to the village till sunset. The division commander determined to withdraw the remainder of the brigade and the survivors were retired successfully that night, and the Third Division remained in position at Changshitun and Likuanpu (133) facing the enemy. General Nambo's brigade's loss was very severe, but that of the enemy was also very great and the effect of beating off his successive attacks was incalculable. During the day the army headquarters was on the sand hill, and we could see large bodies of the enemy retiring toward the north. In view of the importance of the positions in front of the Third Division, the army commander reenforced it from time to time, as follows:

"By order issued at 6 a. m., one battalion, Thirty-fourth Regiment; by order issued at 10.30 a. m., two batteries of heavy artillery from the Eighth Division; by order issued at 2.30 p. m., one battalion of Kobe infantry; by order issued at 6.30 p. m., the two remaining battalions of the Thirty-fourth Regiment.

"Army headquarters spent the night at Hsifanpu and the general reserve at Tehsiangyintzu (135). During this day the Third Army took the line from Chengatun, Chiao-huatun, Fentai. The orders issued that night were for divisions to remain in their positions and attack if opportunity offered, and that the reserve of the army was to be at the sand hill at 5 a. m."

Though the distance which the Eighth Division had come in a direct line was not great, the physical exertions of the men which composed it during the first six days of the battle of Mukden had been tremendously heavy. Attacking day and night, with long tactical moves during the latter, was quite enough to have exhausted any soldiers. By the 7th the Japanese began to show plainly the effects of their hard work, and despite the cold the moment an infantry battalion reached shelter from fire the majority of men fell asleep. In view of their fatigue then, it is not remarkable that their pursuit of the Russians was not more fierce when it began a couple of days later, but that it was carried out with as much vigor as was actually displayed.

Not much change took place in the medical department organizations to the left of the Eighth Division on March 7. The preceding night had again been a very busy one, but the day was not so quiet in Field Hospital No. 3 as the day before, as a few more wounded drifted into it, and wounded were rapidly evacuated from it to No. 1 Field Hospital at Chantaipu. For this the transportation of the advanced field hospital itself was used as well as all returning transportation belonging to the division. The latter had been borrowed for the purpose by the division surgeon on application to the division commander. It was rather remarkable to see how smoothly everything proceeded in No. 3 Field Hospital, which was working to its extreme limit. Daily histories were being made for each man and all parties of wounded were being sent to the rear in charge of the highest ranking soldier among them just as though it were a maneuver. On the right of the division, the second sanitary half was open on this day, as was also Field Hospital No. 2. Both were in the village of Tayushupu. Patients were sent from the latter to Field Hospital No. 1. It was understood that the transport

department for patients was removing patients to the rear from the last-named hospital.

During the afternoon of the 7th great crowds of Russian wounded could be seen going back to Mukden station from Yukuanton or Likuanpu, as that fierce fight of the Third Division is more commonly called. So far as could be made out no ambulances were in use by the Russians and no litter bearers were seen, the wounded either hobbling back themselves or being transported in the springless Russian cart or wagon. It is thought that absence of an adequate medical department here resulted in great losses of Russian fighting men from the firing line, numbers of them going to the rear on the pretext of accompanying wounded.

Location of dressing stations and hospitals, March 7.

	Fifth Division.	Elighth Division.
Dressing stations:		
First and second halves of sanitary company -----	Hsiao-yushupu	Nienkuantun. Tayushupu.
First half of sanitary company -----		
Second half of sanitary company -----		
Field hospitals:		
No. 1 -----	Lichlawopeng	Chantalpou.
No. 1 (two-thirds) -----		
No. 2 (one-half) -----	Hsiao-yushupu. Chantalpu	Tayushupu.
No. 3 -----		Tehsiangyintsu.
No. 4 -----		
Stationary hospitals:		
Sumapu -----		
Waichlapu -----		
Suhupu -----		
Sanchiatzu -----		
Liutunkou -----		
Shantaitzu -----		
Kinchentzu -----		
Line of communication hospital:		
Langtungkou -----		

“March 8.—All this day our army confronted the enemy at close distances and our artillery continued bombarding his positions; the enemy’s guns replied, but less so than on the preceding day. By 11 a. m. we learned that the enemy in front of our First and Fourth Armies had commenced retiring, and that both armies were following them up. The Fourth Army, except the Fourth Division and Tomioka’s detachment, were to join in the pursuit and were to follow the enemy up rapidly to Tiehling. The Fourth Division and Tomioka’s detachment were now attached again to the

Second Army and General Oku issued an order to the commander of the Fourth Division to let Tomioka hold the line from Suchiaton (136) to Erhtaitzu (131) and that the remaining troops were to cross to the right bank of the Hun.

"On the 7th and 8th of March the Fourth Division was severely engaged near Hsiaokushimpu (122), and the first line of the division was now on the line from Tayanglutun through Suchiaton (136), Takushimpu (123), and Peitaitzu (124) to Pachaitai (138), while the same body was assembling northeast of Laishanapu (113), but no great force of the enemy was in front of them. Tomioka's detachment had been engaged at Hanchengtzu (134), assisting the Sixth Division, and was now assembling at Yinkua (140), north of Linchingpu, General Oku's orders could not, therefore, be carried out immediately. The Third Division of the Thirty-seventh Regiment had, however, already assembled, and was sent to army headquarters and joined the army reserve at sunset.

"The front line of the Fifth Division had been in close touch with the enemy, but on the night of the 7th it was withdrawn to Yulinpu (103), across the old railway embankment, and entrenched itself. Our artillery opened fire against the enemy's guns at 5 a. m., but their fire was only replied to from Hsiaoshatotzu (106), but not from either north or south Machiapu (110), and we came to the conclusion that the enemy had already retired. At 10 a. m. the troops of the Fifth Division, who were on the left bank of the Hun, took Erhtaitzu (131), and between 11 a. m. and 3 p. m. we repulsed a small rear guard left by the enemy, and took both north and south Machiapu (110); on seeing that the enemy had retired from both these places the right wing of the Fifth Division at 4 p. m. advanced as far as the southeast of north Machiapu (110), and the left wing from near Tayushupu (101), to the west of Hsiaoshatotzu (106), covered by the mountain guns of the division, which took up a position near the railway embankment. All the other units of this division also advanced, and before midnight of the 8th were between 400 and 500 meters of the enemy. The general reserve of the army and army headquarters went into quarters at Hsifanpu and Soyatun (130)."

The hours of darkness of the night of the 7th of March and the morning of March 8 had again been very busy ones for the medical department organizations of the Eighth Division. The first half of the sanitary company of the division remained at Nienkuantun through the day, but No. 3 Field Hospital was replaced in the afternoon by a stationary hospital which received a large number of patients from the latter, which loaded its stores in readiness to move with its division. The first half of the sanitary company had not been able to transfer as many wounded to the rear as it desired during the previous night, so it continued to send patients to No. 3 Field Hospital after daylight. No difficulties arose for some time, as the morning was misty, and in consequence of this the Russian batteries did not begin their fire early, but some time after 9 a. m. they began to shell wounded crossing the wide plain back of Nienkuantun, to which reference has already been made. The Japanese bearers in charge of the Chinese coolies carrying patients would not permit the latter to leave their burdens, so they zig-zaged across the plain, trying to escape the Russian shrapnel. The Russian guns followed them, but it was so hazy that it is possible that they did not know the nature of the mark at which they were firing. No men were hit here so far as observed. On the right and to the rear of the Eighth Division no changes took place in the medical department organizations.

Location of dressing stations and hospitals, March 8.

	Fifth Division.	Eighth Division.
Dressing stations:		
First and second halves of sanitary company	Hslaoyushupu	Nienkuantun.
First half of sanitary company		Tayushupu.
Second half of sanitary company		
Field hospitals:		
No. 1		Chantaipu.
No. 2 (one-half)		Tayushupu.
No. 3	Hslaoyushupu	Tehsiangyintzu.
No. 4	Chantaipu	
Stationary hospitals:		
Sanchiatzu		
Lutunkou		
Shantaltzu		
Kinchentzu		
Sumapu		
Waichiapu		
Tehsiangyintzu		
Suhupu		
Line of communication hospital:		
Langtungkou		

“March 9.—Army commander issued the following order at 2 a. m. on this date:

“(1) The Eighth Division will leave two battalions of infantry at Nienkuantun (104) and one at Yulinpu (103) under the command of the Fifth Division and will retire at once to the south of the old railway bank and march as quickly as possible toward Lipantai (141) to assist the right wing of the Third Army.

“(2) The Fifth Division will attack the enemy facing it and after taking from Hsiaoshatotzu (106) to Hsiaolutun will advance to the line northwest of these places which stretches from Yangshihtun (109) to Lukuantun (102).

“(3) Two battalions of infantry of the Eighth Division at Nienkuantun (104) and one at Yulinpu (103) are attached to the Fifth Division.

“(4) The Third Division, acting simultaneously with the Fifth, will take Yukuanton (117).

“(5) One brigade of the Fourth Division, less one battalion of infantry, with one regiment of artillery and a battalion of engineers, will cross the Hun near the old railway bridge and attack at 8.30 and advance towards Tapu (105).’

“In accordance with the above order the brigade of the Fourth Division left Wenshinpu (119), crossed the Hun north of Machiapu (110), near the old railway bridge, and advanced toward Tapu (105). The Fifth Division facing Hsiaoshatotzu (106) made a night attack and at 6.30 a. m. the left wing facing the Hsiaoshatotzu (106) got to within 180 meters of the enemy and the right wing to within 300 meters of the enemy, but were checked. The enemy’s artillery from Tapu (105) fired on our front line and reenforcements of two battalions of infantry joined them between 9 a. m. and noon and increased the force against us from Hsiaoshatotzu (106). Further advance was impossible and we received a cross fire from Hsiaoshatotzu (106) and Tukuantun (132) and lost many men. The divisional commander ordered the attack to cease, but to hold on to their position and contain the enemy. The arrival of the advance guard of the Fourth Division near south Machiapu (110) relieved the situation and the day passed with everyone in the same position, with the artillery of the Fourth Division

in action in the afternoon near Takushinpu (123) and the main body of this force deployed near south Machiapu (110). Tomioka took up the line which the Fourth Division had held. The Eighth Division left five instead of three battalions of infantry at Nienkuantun and Yulinpu as ordered, because their strength had been reduced to that of three battalions by the recent fighting, and marched north to Lipantai, leaving Soyaton (130) at 6 a. m. and taking the route through Hsiloalintun and Jahen.

"The enemy in front of the Eighth Division was on the line from Yukuantun (117) through Tafanhsintun (145) to the north, with artillery at the latter place and Makuantzu (146); the Eighth Division detached four battalions to keep touch with the left of the Third Division, quartered its main body at Jahen; and constructed strong defenses on the line in advance from Liyantai to the north. The troops of the Third Army, who were relieved as above, by the 8th division, advanced toward the northeast.

"The Third Division detached two battalions of infantry and one or artillery toward Lipantai to hold the line from that village to the south; the third kept reconnoitering the enemy and bombarding deliberately his position. Army headquarters spent the night at Hsifanpu, and the general reserve was there also. There was a very heavy sand storm all day and nothing could be seen distinctly."

A number of wounded were again brought in from the front and to field and stationary hospitals during the preceding night, but on account of the heavy sand storm on the 9th it was almost impossible to see anything.

As this day completed in great measure observation on the medical department during the battle, it will be well to pause for a moment to review its accomplishments. The opinion has not infrequently been expressed that while the medical department of an army should be competent to succor wounded promptly during engagements of ordinary magnitude, that in great battles, such as Gettysburg, for instance, or such as Mukden proved to be, no medical department could be expected to rescue and shelter all wounded promptly. Taking this general opinion into consideration, the accomplishments of the Japanese at Mukden appear even more

wonderful. According to the reports made to the surgeon-general of the Second Army, this army had 5,908 killed and 16,288 wounded in that fight. (These figures do not correspond exactly with those of the Japanese official report, but the manner in which they were obtained almost guarantees their correctness.) With few exceptions, all these wounded at the latest were collected and brought to dressing station during the first period of darkness after their injuries were received. The exceptions were almost all men who fell so close to the Russian lines that bearers could not reach them. Then, either during the same night or the next night, these patients went back to a field hospital and at the first convenient opportunity farther to the rear. In order to do this, the Japanese had to use every means of transportation available, and some of it was rough and hard, but they undoubtedly succeeded at Mukden much better in collecting and transporting wounded to a safe place than has any other nation in a great battle. It will serve no useful purpose to discuss here the relief of various medical department organizations by those from the rear; this can be easily studied out from the text and from the map. However, attention should perhaps be called to the fact that even when the Eighth Division moved to the north to the aid of the Third Army it had its sanitary company and field hospital to accompany it.

The lines for the evacuation of wounded to the rear, with dates, are shown on the map. It will be noticed that up as far north near the river as Changtan and Lichiaowopeng, the territory of the Third, Fifth, and Eighth Divisions, evacuated south through Langtungkou. From the 1st to the 9th of March this was a busy line, but after that there was no occasion to send wounded from the battlefield by this route, though the hospital at Langtungkou was in operation after March 31. Before March 10 Waichiapu sent wounded to Suhupu, as did also Chantaipu and Tehsiangyintzu. The last-named hospital also forwarded patients to Chantaipu, as did also Hsiaoyuchupu and Tayushupu.

Location of dressing stations and hospitals, March 9.

	Fifth Division.	Eighth Division.
Dressing stations :		
First half of sanitary company-----	Tayushupu-----	Nienkuantun.
Second half of sanitary company-----	North Machlapu-----	Tayushupu.
Field hospitals :		
No. 1-----		Chantalpu.
No. 2 (one-half)-----		Tayushupu.
No. 3-----	Hsiaoyushupu-----	
No. 4-----	Chantalpu-----	
Stationary hospitals :		
Waichlapu-----		
Sanchiatzu-----		
Tehsiangyintzu-----		
Shulingtzu-----		
Shupu-----		
Litunkou-----		
Line of communication hospital :		
Langtungkou-----		

" March 10—The Fifth Division learned during the night of the 9th that the enemy had commenced to retire from Hsiaoshatotzu (106), attacked it in the early morning and took Hsiaoshatotzu (106), Tukuontun (132), and Yangshihtun (109); the Seventh Brigade of the Fourth Division attacked also and at 6.30 a. m. took up a position from the railway line to Tapu (105); the enemy retired in disorder toward the northeast before the Fourth and Fifth Divisions, destroying the railway bridge over the Hun before leaving. The Third Division waited until the morning mist had gone, but realizing that the enemy had begun to retire, attacked them at 9 a. m. and drove them to the east.

" The artillery of the Eighth Division was at Linchiafan (147) bombarding the enemy's guns and infantry, but at 11 a. m., seeing that the enemy had commenced retiring, attacked him and at 2.30 p. m. took up a position from Linchiafan (148) through Tapingchen to Hsiao-chiatun; we heard this day that the Fourth Army had crossed the Hun and was advancing east of Mukden in pursuit of the enemy. General Oku issued orders at 11 a. m.

" (1) The Fourth Division will advance to Sulimatun southwest of Mukden, except one infantry brigade, less two battalions, which will join the reserve of the army.

" (2) The Fifth Division will advance to Mukden station.

" (3) The Third Division will advance to Tapingchen.

" (4) The Eighth Division, connecting with the move-

ments of the Third army, will proceed to the hills northeast of Houtai (152) (Imperial Tombs).'

"The Fourth and Fifth Divisions arrived south and west of Mukden and part of them occupied the city at 7 a. m. The main bodies of the divisions passed the night in positions shown on the map and the Third Division similarly to the northwest of Mukden.

"The Eighth Division quartered on the hills on which the Imperial tombs are situated, in part, and the main body northwest of Mukden. Tomioka's detachment pursued the enemy and quartered south of the Hun near the railway line. Army headquarters passed the night at Changshihtun and the general reserve from the Fourth Division in the villages northwest of Tapu (105). The Third Army still faced the enemy, holding the line from Santaitzu (153) through Chengtitun (154) to Taschiatun. The left wing had a very strong force opposed to it and their movements were checked. The Fourth Army held the line Ehrtaitzu, Yulingpu, and Erhua, on the main road north of Mukden, and were endeavoring to arrest the enemy's retreat. At 11 p. m. orders were issued to the Eighth Division to advance to Tama and join in the pursuit; this division formed itself into two columns and pursued, starting at 8 a. m., and after some opposition was able to arrive at Yulingpu (155) and Yankansui and quartered there. The remainder of the Second Army went into quarters near Mukden and remained there."

Little can be said in reference to the work of the medical department on the 10th of March. The second half of the sanitary company from Tayushupu and No. 3 Field Hospital had accompanied the Eighth Division to the north on the 9th. The hospital was never opened, but the sanitary company located a dressing station at Santaitzu.

Location of dressing stations and hospitals, March 10.

	Fifth Division.	Eighth Division.
Dressing stations:		
First half of sanitary company-----	Hsiaoshatotsu..	Santaitzu.
Second half of sanitary company-----	North Machlapu	
Field hospitals:		
No. 1-----		Chantai pu. Tayushupu.
No. 2 (one-half)-----	Hsiaoshatotsu..	
No. 3-----	Hsiaoyushupu..	
No. 4-----	Chantai pu-----	
Stationary hospitals:		
Waichlapu-----		
Tehsiangyintzu-----		
Chantai pu-----		
Suhupu-----		
Sanchiatzu-----		
Shulintzu-----		
Line of communication hospital:		
Langtunkou-----		

"The Second Army's share of the spoil of this battle were: Prisoners, 64 officers and 4,951 men; horses, 170; mortars, 2; field guns, 10; machine guns, 3; rifles, 10,600; shells, 14,550; rifle ammunition, 17,270,000; ammunition carts, 347; other carts, 300.

Table of dead and wounded of the Second Army at the battle of Mukden, February 27 to March 10, 1905.

	Dead.			Wounded.			Total.	
	Off- cers.	Sol- diers.	Horses.	Off- cers.	Sol- diers.	Horses.	Men.	Horses.
Third Division:								
Infantry.....	44	1,613	10	77	2,492	4	4,226	14
Cavalry.....			2	2	2		4	2
Artillery.....		11	17	5	61	45	77	62
Engineers.....	3	44	2	1	92	3	140	5
Others.....		1	2	1	16	3	18	5
Total.....	47	1,669	33	86	2,663	55	4,465	88
Fourth Division:								
Infantry.....	7	385	16	30	965	16	1,387	32
Cavalry.....			7	1	1	12	2	19
Artillery.....		5	8		8	25	13	33
Engineers.....		9	3		21	1	30	4
Others.....					4		4	
Total.....	7	399	34	31	999	54	1,436	88
Fifth Division:								
Infantry.....	53	1,346	22	133	4,110	37	5,642	59
Cavalry.....		2	9		10	24	12	33
Artillery.....	2	12	26	5	106	87	125	113
Engineers.....	1	12	20		88	6	101	26
Others.....	1	1	1		14	1	16	2
Total.....	57	1,373	78	138	4,328	155	5,896	233

Table of dead and wounded of the Second Army at the battle of Mukden, February 27 to March 10, 1905—Continued.

	Dead.			Wounded.			Total.	
	Offi- cers.	Sol- diers.	Horses.	Offi- cers.	Sol- diers.	Horses.	Men.	Horses.
Eighth Division:								
Infantry.....	43	1,471	48	106	3,833	56	5,453	104
Cavalry.....		1	16	1	8	38	9	54
Artillery.....	4	59	76	17	234	137	314	213
Engineers.....	3	72	5	3	195	7	273	12
Others.....		1	1	3	33	2	37	3
Total.....	50	1,604	146	129	4,303	240	6,086	386
Others:								
Infantry.....	6	82	9	12	371	10	471	19
Cavalry.....		1	2	3	14	5	18	7
Artillery.....	1	23	32	8	199	9	239	91
Others.....			2		3	3	3	5
Total.....	7	106	45	23	585	77	721	122
Grand total.....	168	5,151	336	407	12,878	581	18,604	917

NOTE.—In the number of soldiers noncommissioned officers are included.

The foregoing table is one which was presented to the foreign attachés by Second Army headquarters. The medical records of that army showed 5,908 killed and 16,288 wounded. It is believed that the latter figures are correct. Assuming them to be so, the proportion of killed in total casualties was 26.7 and of wounded 73.3. Wounded were divided as follows: Five per cent very light, able to remain with the line; 20 per cent recovered in the field and in the line of communication hospitals; 15 per cent died of their wounds, and 60 per cent required evacuation to Japan. It was necessary to furnish transportation for the last two classes; that is, 75 per cent of wounded required transportation.

The following is the early official statement of the Japanese in regard to casualties in the medical personnel of the Second Army during the battle of Mukden. It is believed that it is incomplete and far below the true figures in each and every class:

	Killed.	Wounded.
Surgeons.....	0	9
Chief nurses.....	0	7
Nurses.....	12	47
Litter bearers.....	5	68
Assistant litter bearers.....	10	75

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Statement of casualties of medical personnel in the Third Army during the battle of Mukden.

	By rifle bullets.		By shrapnel.		Total.
	Killed.	Wounded.	Killed.	Wounded.	
Surgeons.....	2	6	3	8	19
Noncommissioned.....	2	4	4	3	13
Soldiers.....	9	23	3	13	48
Medical department troops:					
Officers.....		2	1	2	5
Noncommissioned.....		9	1	3	13
Soldiers, including bearers.....	7	67	8	87	169
Grand total.....	20	111	20	116	267

NOTE.—It is believed that these figures are correct, or nearly so.

The following tables show where the dressing stations and the field hospitals of the Fifth and Eighth Divisions were opened during the battle of Mukden, with the dates during which they were open and the number of patients treated:

FIFTH DIVISION.

Dressing stations established by the first half of sanitary company: No. of patients.

Erchiahotzu—	
March 1.....	58
March 2.....	256
Tachuanho—	
March 3.....	52
March 4.....	22
Tayushupu, March 9.....	329
Hsiaoshatotzu, March 10.....	62

Dressing stations established by the second half of sanitary company:

Llutiaoko—	
March 1.....	806
March 2.....	388
Lichlawopeng—	
March 3.....	144
March 4.....	35
Hsiaoyushupu, March 5.....	35

(The second half was joined here by the first half for March 6, 7, and 8.)

March 6.....	55
March 7.....	259
March 8.....	0
North Machiapu—	
March 9.....	92
March 10.....	23

Total 2,646

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Fifth Division field hospitals:

No. 1 (two-thirds), Lichiauwopeng—	
March 3.....	228
March 4.....	79
March 5.....	19
March 6.....	1
March 7.....	0
No. 1 (other third), Sullupatai—	
March 3.....	28
March 4.....	1
No. 2, Kinchentzu—	
March 2.....	430
March 3.....	72
March 4.....	1
No. 2 (one-half), Hsiaoshatotzu, March 10.....	67
No. 3, Hsiaotienzu—	
March 1.....	315
March 2.....	259
March 3.....	3
No. 3, Hsiaoyushupu—	
March 5.....	450
March 6.....	439
March 7.....	70
March 8.....	0
March 9.....	417
March 10.....	75
No. 4, Kinchentzu—	
March 2.....	406
March 3.....	597
No. 4, Chantaipu—	
March 6.....	185
March 7.....	239
March 8.....	142
March 9.....	391
March 10.....	33
Total	4, 943

Eighth Division.

Dressing stations established by the first half of sanitary company:

Heikoutai, March 1.....	}	2, 454
Toutaitzu, March 2, 3.....		
Walchiapu, March 4.....		
Hsiaoyushupu, March 5.....		
Nienkuantun, March 6, 7, 8, 9.....		

Dressing stations established by the second half of sanitary company:

Erchlabotzu, March 1, 2.....	}	1, 171
Tayushupu, March 4, 5, 6, 7, 8, 9.....		
Santaitzu, March 10.....		

Grand total..... 3, 625

Eighth Division field hospitals:

No. 1, Sumapu, March 2, 3.....	}	5, 234
No. 1 (one-half), Walchiapu, March 4, 5, 6.....		
No. 1 (one-half), Chantaiapu, March 5, 6.....		
No. 1, Chantaiapu, March 7, 8, 9, 10.....		
No. 2, Heikoutai, March 1, 2, 3, 4.....		
No. 2 (one-half), Tayushupu, March 7, 8, 9, 10, 11.....		
No. 3, Tehshiangyintzu, March 5, 6, 7, 8.....		

The great excess of patients received in field hospitals, compared with those registered at dressing stations, is rather remarkable.

The following statement shows the number of field hospitals opened in the divisions of the Second Army at Mukden, the patients received in the field hospitals of each division, and the average number of patients per field hospital. The total, it will be noticed, does not correspond with the total number of Japanese wounded; of course a moment's thought will show that it would not be likely to do so.

	Number of field hospitals.	Number of patients received.	Average number of patients for each field hospital.
Third Division	5	2, 873	474. 6
Fourth Division	8	4, 817	539. 6
Fifth Division	8	4, 948	617. 9
Eighth Division	7	5, 234	747. 7

The following is the record of the stationary hospitals of the Second Army at the battle of Mukden:

Stationary hospitals.

	Russian.	Japanese.
Sumapu (Mar. 3-8)	75	1,915
Walchiapu (7-11)	0	1,385
Tehsiangyintzu (8-10)	0	401
Chantai pu (10—)	827	5,501
Suhupu (7—)	279	5,883
Sanchiatzu (7-13)	16	869
Shulingtzu (9-29)	72	789
Liutunkou (Feb. 27, Mar. 9)	38	2,015
Shantaitzu (Feb. 16-Mar. 8)	9	753
Kinchentzu (4-8)	9	1,028
Total	1,316	20,594

Though the actual fighting of the Second Army at the battle of Mukden ceased on March 10, the medical department of that army was occupied in disposing of the wounded for a considerable time after that date. On arrival at Mukden, at the termination of the battle, Russian hospitals were found in operation both at the station and at the southeast of the town, just outside the wall. The former consisted of a half underground hospital, a Decker hut, some tents, and several Cossack barracks, all of which were being administered by different sisterhoods of the Red Cross. The town hospital, which had good permanent buildings specially constructed for hospital purposes, was the Russian military hospital, though in peace times it is understood that it was mainly devoted to the care of Chinese. The Russians had done very well in the matter of sending back patients by train before their retreat, but a good many still remained at Mukden on the arrival of the Japanese troops. The Japanese authorities report 1,700 captives and wounded there, most of whom were patients in the station and city hospitals, where a number of Japanese were also found. The majority of the latter were at the station. Some of the Russian medical staff had also been left behind; this consisted of about 80 persons, all told, nearly all of whom belonged to the Red Cross, there being but two military surgeons.

On March 11 the Mukden station hospitals were in the greatest confusion; this had been much increased by an at-

tempt to burn them in the interval between the departure of the Russians and the arrival of the Japanese. The fire had necessitated the moving of many patients out of the hospitals at night and then bringing them to the uninjured buildings after it had been checked. By some the fire was credited to Chinese, while others insisted that it had been started by Russian soldiers detailed as nurses. Whether the latter ascribed this to lawlessness, drunkenness, or to the fact that the Russian soldiers took this opportunity to vent their spite on the hospital authorities for some previous occurrence could not be learned. Though the station hospitals were in confusion, both Russian surgeons and nurses, including a number of women, were at work in them on the 11th of March. So far as known, the patients in these hospitals, including Japanese as well as Russians, all remained under care of the Russian medical personnel until the 13th of March.

The Fourth and Fifth Divisions of the Second Japanese Army and the Fourth Japanese Army were quartered near Mukden after the battle, and all of these organizations opened hospitals there. The Fourth Army took charge of the town hospital, and the Fourth Division established a small hospital in the half underground hospital building near the station. By far the most important hospital work after the battle was performed, however, by No. 2 Field Hospital of the Fifth Division at Mukden station. This was established in one of the Cossack barracks there on March 13. (All of these barracks had been used for hospital purposes by the Russians.) On its opening it immediately took over the Japanese patients from the Russians; the Russian hospital personnel cared for their own for some time longer.

No. 1 Field Hospital of the Fifth Division was also soon opened in a small Chinese village near Mukden station. This received cases of illness only, and was finally made a Sheibyoin. Neither this nor the other Sheibyoin at Mukden will be described here, as their discussion does not pertain to an account of the battle of Mukden. In fact, for some time it is only necessary in this connection to speak of No. 2 Field Hospital of the Fifth Division, it being understood that the other hospitals just spoken of transferred some cases to it. By the 18th of March this hospital had 618 patients—256

sent to it directly and 362 transferred by the Russians. Evacuation of patients south from No. 2 was very rapid, no cases being retained except such as were absolutely unable to bear transportation, so that by March 26, the date on which the Russians turned over all medical arrangements to the Japanese, there were hardly more than 200 patients here, which were about equally divided between Russians and Japanese. This does not represent the entire work of the hospital during this period, however, as many others had been received meanwhile, some of whom were among those who remained under treatment, though the great majority had gone farther to the rear. Though while this hospital was run by No. 2 Field Hospital of the Fifth Division it was kept clean, no extensive police work, repairs, or filling and ditching of the grounds, all of which were needed, was undertaken until a line of communication hospital of the Fourth Army, which took charge of all the Mukden hospitals, had replaced it about a month after the battle. At this time the first field hospital of the Fifth Division was still in operation at its old site near Mukden, the second had gone south of Changtan for a rest which its personnel needed badly, as the work at the station had been exceedingly severe, the third was in the train, and the fourth was a Sheibyoin.

Returning now to No. 2 Field Hospital of the Fifth Division at Mukden station, the evacuation of patients to the rear will be discussed. To understand this clearly it will be necessary to refer both to the map of the battle and to the list of stationary hospitals given in the text. Almost as soon as the Second Field Hospital of the Fifth Division was established at Mukden station, it began to send patients to the rear by a transport department for patients. This department was the one which belonged to the Eighth Division.

Before March 31 all sick and wounded going to the rear from Mukden station went to a stationary hospital established at Chantaipu. Large convoys of wounded left for this hospital nearly every morning. In order to carry them, the department for the transport of patients hired many Chinese coolies. The worst cases were each carried on a litter borne by four Chinese coolies on their shoulders.

These bearers were not carefully selected in respect to their relative stature, and in consequence of mixing tall and short bearers in one litter squad, litters were not always carried in the horizontal position. Neither were the carriers at all skillful, and they often made awkward work of their task. They went very rapidly, however, making the distance to Chantaipu, 15 miles, including all rests, in $5\frac{1}{2}$ hours. Cases graded as most severe, second to those carried by the bearers, were transported on Japanese handcarts, which were drawn by two Chinamen, one in the shafts and the other at one side, pulling by a looped rope leading from the front of the cart over one shoulder. These carts are just long enough to take the Japanese litter lengthwise. They have no springs, of course, but in order to diminish the jar to the patient transported small rolls of matting, on which the litter poles rested, were placed at the front and rear. On stretches of smooth road the carts did not prove uncomfortable, but when the wheels fell into pitch holes, which not infrequently happened, the patients were severely shaken and suffered a good deal of pain in consequence. The least severe cases of illness and injury were transported on Chinese carts, four or five men to a cart. As would be expected, these springless vehicles were very rough riding.

The stationary hospital at Chantaipu was typical of such organizations. It was established in this rather small Chinese village on March 10, when it replaced two field hospitals, one belonging to the Fifth Division and the other to the Eighth. It belonged to the Fourth Division. The greater part of the village in which this hospital was located was occupied by it. The Chinese houses used for it were of the usual type, but they had been well policed. The operating room, fitted up like that of a field hospital, was neat and clean. Special ingenuity had been shown in the apothecary department, which made a good display with its array of neatly arranged bottles. No foods were issued from it except eggs and condensed milk. The hospital experienced a good deal of trouble in securing food, and its intendant officer was compelled to go to Yingkou after scouring a good deal of the surrounding country for food with little result.

The supplies of stationary hospitals, as will be remembered, differ but slightly from those of field hospitals, and one might have thought himself in a field hospital here if it had not been for the much larger personnel, the entire hospital being present. From March 10 to March 23 the hospital treated 4,497 Japanese and 452 Russians. Whenever practicable patients were sent farther to the rear, but all cases requiring it were retained and operated on when necessary, after which they were kept until they were in fit condition to travel.

Another department for the transport of patients operated from this hospital to the rear, that of the Sixth Division. For some days after the stationary hospital was established to Chantaipu all patients transferred from it went to another stationary hospital at Suhupu and then to a stationary hospital on the railroad at Shulingtzu before March 21, and at Suchiatun station after that date. Later patients were sent directly from Chantaipu to the last-named hospital.

After March 31 until May 1 patients from the Fifth Division field hospital at Mukden station were sent direct to Suchiatun station. The means for this transportation were the same as have already been described and the same transport department for patients was in charge of them.

A line of communication hospital belonging to the Second Army was opened at Suchiatun station on March 21. Prior to that time, as has been stated, the hospital at Suhupu sent its patients to the stationary hospital at Shulingtzu. The site taken for the line of communication at Suchiatun station was near the railroad, so that patients from it could be loaded directly on the trains. While the patients brought to it came mainly from the Second Army, some were received from the Third Army. Its contributing hospitals were Suhupu, Chantaipu, and Mukden. The transport departments for patients of the Third, Sixth, and Eighth Divisions carried patients to it by the same method which has been described in discussing the evacuation of sick and wounded from Mukden station. The personnel of the hospital at Suchiatun station consisted of 14 surgeons, the chief of whom was a major, 3 apothecary officers, one intendants officer, with a noncommissioned officer as assistant, and about 130 nurses.

A large half-underground Russian hospital was used here for hospital purposes by the Japanese. The main building, which was 60 yards long and about 35 wide, could accommodate 500 patients. In addition, there were about twenty underground houses available. The latter had been utilized by the hospital at times, and some of them were set aside for contagious diseases. A small mat dressing room had also been erected outside of the main building. A few tents were still up on April 10, but they were not used except for stores, as it was entirely too cold. In winter the underground hospital probably gave fairly good shelter, but in April, after some rain and snow, there were 2 or 3 inches of mud on its floor. From the 21st of March to the 3d or 4th of April, 5,000 patients entered this hospital. Slight cases were ordinarily evacuated the day they arrived, but more severe ones stayed at the hospital for a day or two. Patients leaving the hospital were carried the 20 yards to the train by nurses; the litter was the common type carried on a pole, like the kago. Cars returning empty to Liaoyang were used for the train transportation of the patients. Patients were evacuated twice daily, and the daily average number sent was 500. The attendance for patients on trains was supplied from the hospital. Each train usually had 1 surgeon, 1 chief nurse, and 5 nurses, but though there was never more than 1 surgeon the number of nurses was increased when necessary. The distance to Liaoyang is so short that no food was sent with patients. Patients were transported by train both in the lying and sitting positions. The box cars each took 5 or 6 lying cases on litters or 25 cases able to sit. Sitting cases had blankets on which to sit, or straw, though sometimes they had nothing but the bare floor. Even cases with plaster splints on the thigh were carried as sitting cases. All patients stopped at Liaoyang, which is only about 30 miles away, whence they were forwarded to Dalny or Yingkou.

A line of communication hospital of the Fourth Army, as has been intimated, took charge of hospital affairs at Mukden station after April 7. Until May 1 patients from this were transported to Suchiatun station in the manner already described. After that date the railroad was utilized to carry sick and wounded directly from Mukden station to Liaoyang.

An advance supply depot was also established in Suchiatan Station at the same time that the line of communication hospital was located in that town. This depot, which was the most advanced of the Second Army on the railroad during the battle of Mukden, accompanied the stationary hospital to Shulingtzu on March 9, where it remained until March 21.

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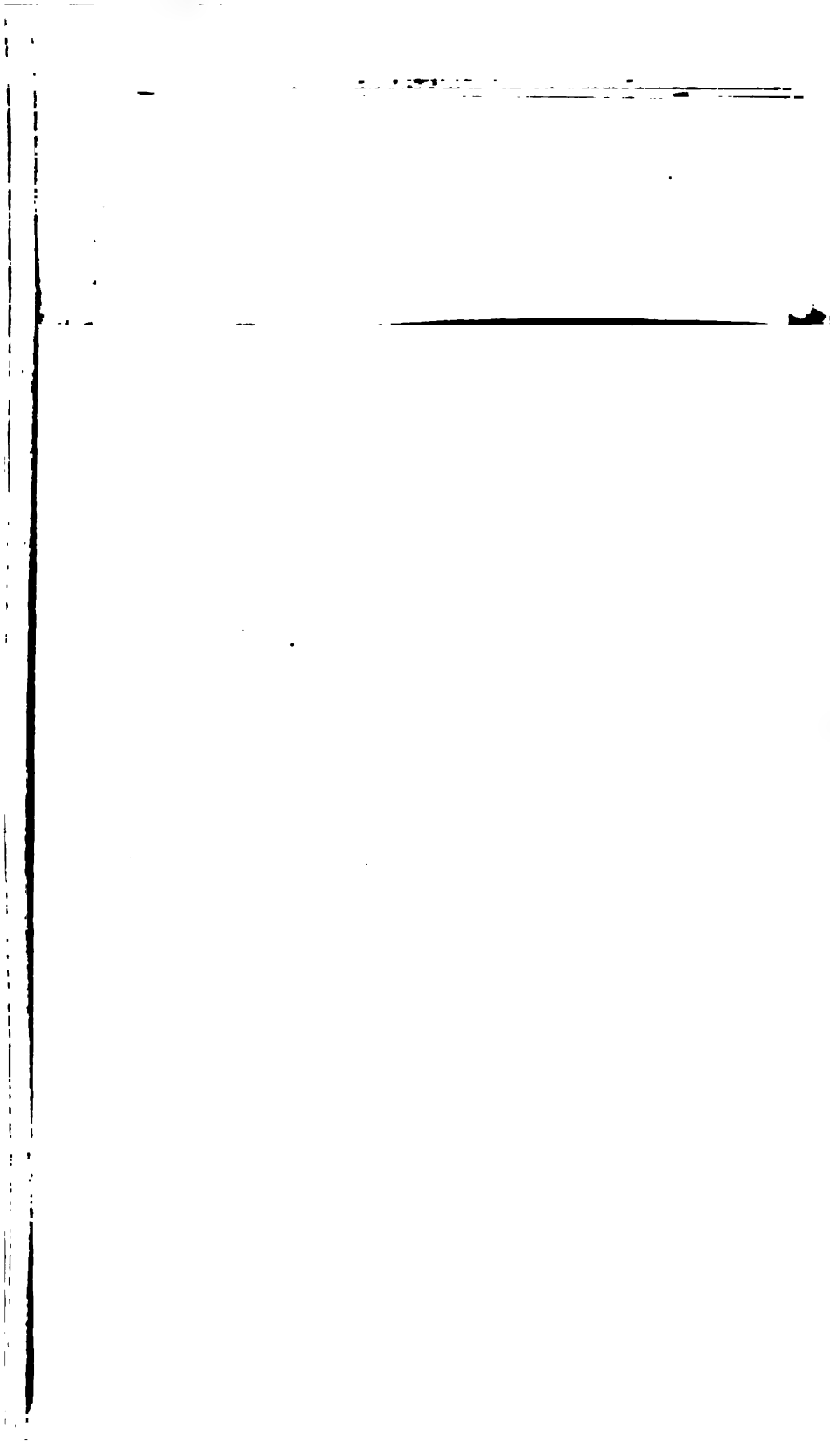
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SECOND (MILITARY INFORMATION) DIVISION.

GENERAL STAFF.

No. 8.



REPORTS

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ATTACHED TO

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DURING THE

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(MARCH 1, 1907.)

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Captain WILLIAM V. JUDSON, Corps of Engineers.

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Office of the Chief of Staff.

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NOTE.

General maps of the region in which the war occurred are found in Part I of these reports.

REPORT OF LIEUT. COL. EDWARD J. M'CLERNAND, FIRST CAVALRY, OBSERVER WITH THE JAPANESE FORCES IN MANCHURIA.

NOTE.—Lieutenant-Colonel McClernand sailed from San Francisco on April 18, 1905, and arrived in Tokyo, Japan, on May 9. On May 17 he was advised that he and Captain Pershing, military attaché in Tokyo, had been assigned to the First Army, commanded by Gen. Baron Tamenoto Kuroki, and that they would sail on an army transport from Kobe on May 25. On account of the arrival of the Russian fleet, under Admiral Rozhdestvenski, off the west coast of Japan, the departure of the transport was delayed until May 31, on which date it sailed for Dalny. On June 4 Lieutenant-Colonel McClernand and Captain Pershing went by rail to Mukden, where they arrived on June 5. From Mukden they proceeded to the headquarters of the First Army at Chiuchiatun, and reported to General Kuroki on June 9. Lieutenant-Colonel McClernand returned to Ujina, Japan, October 2, and remained in Japan until December 23, 1905, when he sailed from Yokohama to return to the United States via Europe.

CHAPTER I.

MILITARY ESTABLISHMENT, GRADES OF RANK IN, HOW RECRUITED AND ORGANIZED; TRAINING; OFFICERS; MILITARY SCHOOLS; NONCOMMISSIONED OFFICERS.

In order to fully appreciate what the Japanese army is capable of accomplishing in the field, it will be well to take a hasty glance at the organization of the entire military establishment. With a knowledge of the salient features of recruitment, organization, equipment, and supply the reader will be able to follow the subsequent report of operations in the field with much abbreviated explanations of the functions of the various offices and departments and with a broader understanding of that military machine that achieved such uniform success.

The minister of war is selected from among the generals or lieutenant-generals of the army, and everything about the department bears the stamp of military method and precision.

The military grades in Japan are as follows:

Privates (usually spoken of as "soldiers") :

Second-class soldier.

First-class soldier.

Superior soldier.

Noncommissioned officers:

Corporal.

Sergeant.

Sergeant-major.

Special sergeant-major, answering to warrant officer.

Company officers:

Second (sub) lieutenant.

Lieutenant.

Captain.

Field officers:

Major.

Lieutenant-colonel.

Colonel.

General officers:

Major-general.^a

Lieutenant-general.

General.

Field marshal.

Surgeons, intendants, and other noncombatant officials have ranks assimilated to the officers and noncommissioned officers of the combatant troops.

The Emperor is the supreme head of the army and navy.

CONSCRIPTION.

Men between 17 and 20 years of age may enter the service by voluntary enlistment, while those between 20 and 40 are subject to conscription. There are some legal exceptions in the enforcement of the conscription laws, but generally speaking they are fair and impartial, and are based on the indisputable assumption that the state has the right to utilize the services of every man, within reasonable age limits, not only in its immediate defense, but in the preparation necessary thereto. Although the English-speaking race is wont to look upon conscription as autocratic, it is essentially democratic, for it places all citizens on the same plane, showing favor neither to the rich nor poor in the matter of national defense.

The Japanese army is divided into four general classes:

1. Standing army (jobi).
2. Reserve army (kobi).
3. Conscript reserve (hoju).
4. National army (kokumin).

The Jobi is subdivided into:

- (a) Genyeki, the active army; troops with the colors.
- (b) Yobi, the first reserve.

Medical officers annually classify men in civil life who are liable for military duty as in "excellent," "fair," or "unfit"

^a The grade of brigadier-general is not known in the Japanese army.

condition. Later, lots are drawn among the first class and those drawing the lowest numbers are posted to the different corps of the active army according to their qualifications and the necessities of the service and ordered to join on a specified date. The remainder of the first (excellent) class is assigned to the conscript reserve. The number in the excellent class is usually in excess of that required, but it is believed that during the war the second class was also drawn upon to a considerable extent. The following table shows how the conscripts are distributed and trained:

Tabulated statement of the systems of conscription and the military training of reserves.

Term of service.	How constituted.	Training.
1. Standing army (jōri). (a) Active army (genyeki).	All who have reached the age of 20, liable.	
(b) First reserve (yōri).	Drafts are made on this reserve to fill units of active army to war strength, and to form depots.	
2. Second reserve (kōri)	Organized in separate units; supplements each division of active army intact on mobilization; one brigade per division.	
3. Conscrip reserve (hōfu).	Composed of those in excess of the numbers required for the active army, with liability for 1 year only of being called to make up deficiencies therein.	
4. National army (kokumin).	Consists of all those between 20 and 40 years of age, who have completed their reserve army service and those who have completed their conscript reserve service.	

* During the war a soldier did not pass to the reserve upon the expiration of three years in the active army, but continued to serve therein with the understanding that his service in the reserve would be correspondingly reduced.

† Before the war the conscript reserve consisted of two classes, called first and second term conscripts. There is now but one class. Previously the first-term conscripts were called out for ninety days' training in the first year and for sixty in the second and fourth years, and it is understood a similar regulation will apply hereafter for the combined classes. The second-term conscripts were practically untrained, the service being only nominal. Thus the new arrangement, if carried out as indicated, will give a greater number of trained men.

(Called out: First reserve for 21 days, and second reserve for 14 days every year. While the reserves are out as a force every year, yet each individual is called only every second year. Officers on the "reserve list" have a special call, to be explained later. (See pages Nos. 13 and 15.)

(Called out in time of war or danger. In peace time they are distributed (without service) among units of active army. In war form independent depot battalions.)

(Called out in time of war or national danger.)

As stated, there are some exceptions made in the enforcement of the conscription laws. Those referring to the "one-year volunteers" deserve mention. Men between 17 and 28 years of age, who have completed their education in the higher schools and who possess sufficient means to pay for their food, clothes, etc., may serve voluntarily for one year with the colors, and then pass to the first reserve and, subsequently, to the second reserve. They receive special military training and may be placed on the "reserve list" for officers of the first and second reserves. While on this list they are called out for ninety days' training and instruction in the first year and from three to five weeks every second year thereafter. It is also possible for some of them, on passing the prescribed examination, to become officers in the Active Army.

CONSCRIPTIONAL TERRITORIES.

Territories assigned for conscriptional purposes coincide with regimental and divisional districts and with the smaller islands. The regimental and island districts are subdivided as convenience may dictate for enforcing conscription.

Except in the Guards and First divisions, each regiment of infantry is recruited from one regimental district, under orders from division headquarters. To other arms in each division special districts are assigned, each comprising several regimental districts.

The regiments of infantry in the First Division are each recruited from two regimental districts. The infantry of the Guards Division is drawn from the recruiting districts of all the other divisions; other arms from the districts of the First Division.

Previous to the war with Russia the railway corps was recruited from six divisional districts, and doubtless a similar arrangement will obtain hereafter.

QUALIFICATIONS FOR RECRUITS.

The army regulations of 1905 require that recruits be physically capable and at least 4 feet 11.65 inches high.

Infantry, cavalry, train, and transport recruits must be over 5 feet 2 inches; artillery and engineers over 5 feet 5.4

inches; hospital corps over 5 feet 0.8 inches; tailors, shoemakers, etc., must be at least 4 feet 11.65 inches and have a fair knowledge of their trade.

All except transport recruits, tailors, shoemakers, etc., must be able to read. The cavalry and engineers must also be able to write. A knowledge of arithmetic is required for coast artillery, engineer, and train recruits.

In the cavalry one-twelfth of the recruits must be suitable for smiths; in the coast artillery one-sixteenth for smiths and carpenters; in the engineers one-twentieth for smiths, one-sixth for carpenters, one-fifth for boatmen, and the remainder for telegraph or railway work; in the train one-tenth for smiths and one-fifteenth for saddlers, carpenters, etc.

No man who has been convicted by a civil court of a crime can serve in the Japanese army.

OFFICERS.

The officers are drawn from the following classes:

1. Graduates of the "central military preparatory school," or of a "local military preparatory school," who have successfully passed the prescribed examination.

2. Graduates of government or local ordinary middle schools (public), or of ordinary middle schools (private), specified by the inspector-general of education, who hold certificates of scholarship from either of said schools, and who have the permission of a regimental commander to be enrolled.

3. Candidates who possess certificates of scholarship of similar requirements to those of the graduates of the ordinary middle schools mentioned above, and who have passed a special examination before the military commission.

A candidate for a commission must serve as follows: One year with his regiment (six months if a graduate of the central military preparatory school); then twelve months at the officers' school, after which he returns as a "probationary officer" for six months more service with his regiment, and during this time performs the duties of chief of section. The propriety of now granting him a commission is determined by the officers' council.

A candidate officer from the central military preparatory school on first joining his regiment may be directed to perform the duties of a superior soldier, and may be promoted to the position of sergeant in a few months. A candidate from any other school enters his regiment as a first-class soldier, but after eight months may be promoted to sergeant.

Officers for the first and second reserves may be obtained as follows:

1. "One-year volunteers" who have been placed on the "first reserve list," after successfully passing the prescribed examinations. The periods for which they are called out for training have been stated.

2. Officers and noncombatants who have been released from service with the colors before the usual period and who have been placed on the first reserve list.^a

3. Noncommissioned officers on the first reserve list enjoying the treatment accorded officers.

Those in the second class are called out for training every third year; first reserve for forty-two days and the second reserve for twenty-eight days. The noncommissioned officers in the third class are called every two years; first reserve for twenty-eight days and second reserve for twenty-one days.

Reserve officers are junior to those of the same grade in the active army.

Officers of the national army are, under the supervision of the Emperor, appointed by the war minister on the recommendation of divisional commanders.

The war naturally caused a departure in many instances from the foregoing regulations, and many meritorious and carefully selected noncommissioned officers were commissioned with satisfactory results, for as usual it proved to be an excellent school. Existing orders authorize the appointment of noncommissioned officers, under certain conditions, to the officers' school up to 26 years of age.

Before leaving the subject of officers it may be well to enumerate the military schools of Japan to better show the thought and study that is devoted to the military profession.

^a The first reserve list should not be confused with the first reserve.

MILITARY SCHOOLS.

Those marked with an asterisk (*) admit noncommissioned officers to at least part of the course.

SCHOOLS FOR BOYS, CANDIDATES FOR COMMISSIONS.

1. *Local military (or military district) preparatory schools.*—Of these there are six throughout Japan. Length of course, three years.

2. *Central preparatory military school, Tokyo.*—Course, two years. Students are graduates from No. 1.

3. *Officers' school, Tokyo.*—Course, one year. Students are graduates from No. 2.

OTHER SCHOOLS.

4. *Staff college, Tokyo.*—Course, three years. Students, selected lieutenants, and captains from the army at large, except the gendarmerie.

*5. *Toyama tactical and gymnastic school, Toyama.*—There are three classes of students:

(a) Students of tactics selected from captains and lieutenants of infantry. Occasionally officers of fortress artillery and engineers take this course. There is also instruction in musketry. Course, ten months.

(b) Students of gymnastics and fencing selected from lieutenants, sublieutenants, and noncommissioned officers of infantry, and sometimes from cavalry, artillery, engineers, and train. The officers are also instructed in musketry. Course, seven months.

(c) Students of field music taken from musicians with the rank of sergeant. Course, two months.

*6. *Military practice school for cavalry, Tokyo.*—The students are divided into two classes:

(a) Students of tactics selected from captains and lieutenants of cavalry. Course, eleven months. Occasionally field officers take the course in tactics.

(b) Students of equitation and horsemastership selected from lieutenants, sublieutenants, and noncommissioned officers of cavalry and sometimes from the artillery and train. Course, eleven months. Selected cavalry officers in this class may be retained a second year for more advanced instruction.

7. *School of artillery and engineers, Tokyo.*—Course, one year, and about one-third of the students are selected to remain a second year for a more advanced course. The students are taken from the sublieutenants, lieutenants, and occasionally from captains of both arms.

8. *School of gunnery for field artillery, Tokyo.*—For the better education of the students in the tactics and gunnery of field artillery. The students are divided into two classes:

(a) Consists of selected captains and lieutenants from each regiment of field artillery. Course, three months.

(b) Consists of sublieutenants and lieutenants selected from among the graduates of the school of artillery and engineers. Course, two months.

Two courses in each class are held yearly, and sometimes a field officer may be selected to take either course.

*9. *School of fortress artillery, Yokoska.*—Students are divided into three classes:

(a) Students are selected from the lieutenants and captains of each regiment of fortress artillery. Course, three months.

(b) Students are selected from the sublieutenants and lieutenants, graduates of the school of artillery and engineers. Course, two months.

Classes (a) and (b) study electricity and the tactics and gunnery of fortress artillery. Two courses in class (a) are held yearly. Field officers occasionally take either course.

(c) Students are selected privates and noncommissioned officers from each regiment of fortress artillery. The privates are named from those of the latest conscription, and the noncommissioned officers must have at least two years to serve. Instruction is given in electricity. Course, one year.

*10. *The educational telegraph battalion.*—It is not believed this battalion is generally classed with the schools, and yet it seems proper to include it under this head. Students are selected from among the company officers of cavalry, fortress artillery, and engineers, and from the privates and noncommissioned officers of the latter two arms. The privates taken must be in their first year of service, and noncommissioned officers must have at least two years to serve.

The course for officers is one year; for noncommissioned officers and privates, eighteen months.

Officers are sometimes sent from this battalion to the school (civil) of posts and telegraphs.

11. *Army medical school*.—The students are divided into two classes:

(a) Medical officers below the rank of captain. Course, four months.

(b) Candidates for admission to the medical department. Course, one year.

*12. *Veterinary school*.—Intended to furnish the veterinary personnel of the army. Students must be between 18 and 25 years of age, and engage to serve seven years. Course, three years.

This school also admits—

(a) Veterinary officers for instruction in veterinary science and farriery. Course, five months.

(b) Noncommissioned officers and candidates for noncommissioned officers of cavalry, artillery, and train; the noncommissioned officers for three and the candidates for nine months instruction in farriery.

13. *Administrative school*.—For the instruction of officers for the pay department (intendance). The students are divided into two classes:

(a) Candidates from the ranks, or if from civil life they must serve six months as a soldier before entering the school. They are educated to fill the lower grades in the department. Course, two years.

(b) Selected from the lieutenants and captains of the department, on the recommendation of the division commander and after successfully passing the required examination: they are educated to fill the higher grades in the department. Course lasts at least one year.

14. *Surveyors' school*.—This school is under the survey department, which is subordinate to the chief of staff. The length of course is not known.

15. *School of music*.—Attached, as already stated, to the Toyama tactical and gymnastic school.

There is an inspector (director) general of education, selected from among the generals or lieutenant-generals of the army, who, under the direct supervision of the Emperor, has general charge of all military schools, except the staff

college; he also designates the course of training for those joining the ranks, in order to insure uniformity of instruction throughout the army. This plan has some obvious advantages.

NONCOMMISSIONED OFFICERS.

ACTIVE ARMY.

Before entering on their duties as such, noncommissioned officers are carefully trained. Formerly there was a school for this purpose, but now they are trained in the regiment. Before appointment they are required to serve three years as privates (soldiers), when they may be appointed by the company commander for one year, after which, if the man be satisfactory, he may serve as a noncommissioned officer until 40 years of age. The advancement of noncommissioned officers from grade to grade will be treated under the head of promotion.

RESERVES.

Noncommissioned officers of the reserves are recruited from the active army and from lance corporals, who on leaving the service with the colors have either been appointed noncommissioned officers or have been furnished with certificates of fitness for the same.

CHAPTER II.

PROMOTION; AGES FOR RETIREMENT; DISCIPLINE.

OFFICERS.

Promotion is either by seniority or selection. Up to the grade of sub (second) lieutenant it is by selection; from sublieutenant to lieutenant it is two-thirds by seniority and one-third by selection; from lieutenant to captain it is one-half by seniority and one-half by selection, and above the rank of captain entirely by selection. To include the grade of captain promotion is regimental; above that, in the arm. Proposals for promotion by selection up to include the rank of captain are made by regimental commanders and the chief of staff of the division, and require confirmation by the division commander. When there is no division the recommendations are submitted by the colonel and brigade commander. The brigade and division commanders make recommendations for promotion from a captaincy to include a colonelcy.

The Emperor takes final action, and himself nominates all general officers.

To receive promotion to a higher grade an officer must have served in the grade below as follows:

For lieutenant, two years as second (sub) lieutenant.

For captain, two years as lieutenant.

For major, four years as captain.

For lieutenant-colonel, three years as major.

For colonel, two years as lieutenant-colonel.

For major-general, two years as colonel.

For lieutenant-general, three years as major-general.

Thus, to reach the grade of lieutenant-general an officer must have served for eighteen years and have passed through all the commissioned grades, gaining in this way a proper appreciation of the duties and responsibilities of each.

Promotion from the grade of lieutenant-general to that of general is by Imperial will, as is the appointment of field marshal.

The system of promotion by selection works well and, it is believed, gives general satisfaction. It certainly gives an incentive to exertion and a reward for labor well performed. It draws a sharp line between indifference to and zeal in the discharge of duties. Many inquiries on the subject failed to discover a single instance in which it was claimed that injustice had been done.

The army commander can promote an officer for distinguished service in the face of the enemy, and if the emergency exists due to the lack of candidates on the list for promotion, he may also select officers and promote them to fill vacancies when in the presence of the enemy.

NONCOMMISSIONED OFFICERS.

As previously stated, a noncommissioned officer, before appointment as such, must have served three years as a private. For promotion above the grade of corporal he must have served as follows:

For sergeant, six months as corporal.

For sergeant-major, one year as sergeant.

For special sergeant-major, two years as sergeant-major.

For sublieutenant, two years as special sergeant-major.

Promotion from special sergeant-major to sublieutenant is a privilege, and the candidate must be deserving and possess an education fitted to the position of an officer.

PRIVATES.

The change from second to first class soldier is made on merit after one year's service. The promotion is made by the captain, with the colonel's approval. From time to time the captain recommends transfers from the first class to the superior class, and these are made by the colonel as vacancies occur.

The regulations governing promotion permit the time required to be passed in the several grades to be reduced by one-half in time of war, and doubtless it was further reduced on occasions during the recent war.

and with banners; school children were lined up near the stations, and the entire population of the several villages seemed to be present. The conscripts departed amid the shouts of "banzai," and with the prayers of their fellow-citizens for a faithful service with the flag. Soldiers so drawn are not apt to desert the colors, or to run away before the face of the enemy. They well know that to do either will incur the contempt of their friends at home and bring disgrace upon themselves and families. Honorable service and discharge will, on the contrary, be rewarded by the admiration and gratitude of those among whom the conscripts were reared. Another time I happened to be among the mountains in one of the most remote sections of Japan when a few soldiers who had served in Manchuria returned to their homes. The simple but whole-souled reception given them by their fellow-villagers was touching in the extreme. They were met by men, women, and children bearing banners, and headed by local mountain bands that gave forth most weird music. The principal citizen of the village delivered an address to the returning heroes and extolled their virtues and those of the comrades they had left sleeping in the plains and amid the mountains of Manchuria. One who was lame from a wound, and whose home was high up on the mountain, was placed on a horse, and as far as the eye could reach could be seen winding his way along the mountain side to his humble dwelling, followed by his admiring neighbors. It had been said that the battle of Waterloo was won on the football fields of old England, and with equal truth it may be said that the unrivaled heroism of some of the assaults at Port Arthur had its birth in the martial spirit of those who remained at home among the mountains and in the valleys of beloved Japan.

Here is a lesson worth taking to heart. If our countrymen would have their Army at its best, they must give it their affection, and always encourage a pride among its soldiers in the faithful discharge of duty. They must extend to the honorably discharged soldier a kindly welcome, and give to the deserter the contempt that his conduct so richly deserves.

CHAPTER III.

LINE OF THE ARMY, INFANTRY, CAVALRY, ARTILLERY, AND ENGINEERS.

INFANTRY.

ORGANIZATION.

The infantry regiment consists of three battalions of four companies each.

The regiments are organized into divisions, each of two brigades of two regiments.

A division is commanded by a lieutenant-general, a brigade by a major-general, a regiment by a colonel, a battalion by a major, and a company by a captain.

The division has other arms attached to it and is intended to be a complete unit in itself. The brigade, unless independent, has no attached troops.

The following tables give the strengths prescribed before the war for the units noted. During the war the numbers entered in the table for the war establishment were undoubtedly exceeded on occasions.

Peace establishment.

Organization.	Persons.				Horses.			
	Officers.	Noncommissioned officers.	Privates.	Total.	Saddle.	Pack.	Draft.	Total.
Company	5	30	121	156				
Regiment				1,950	14			14

^a Includes one candidate for a commission, frequently called a "probationary officer."

War establishment.

Organization.	Combatants.				Noncombatants.				Horses.				
	Officers.	Noncommissioned officers.	Privates.	Total.	Officers.	Noncommissioned officers.	Privates.	Total.	Grand total.	Pack.	Draft.	Riding.	Total.
Company.....	5	30	200	235					235				
Battalion staff.....	2	6		8	3	2	50	55	63	50		4	54
Four companies.....	20	120	800	940					940				
Total.....	22	126	800	948	3	2	50	55	1,003	50		4	54
Regimental staff.....	2	8		10	1	1	3	5	15	3		4	7
Three battalions....	06	378	2,400	2,844	9	6	150	165	3,009	150		12	162
Total.....	68	386	2,400	2,854	10	7	153	170	3,024	153		16	169
Brigade staff.....	3	5		8			3	3	11	3		6	9
Two regiments.....	136	772	4,800	5,708	20	14	306	340	6,048	306		32	338
Total.....	139	777	4,800	5,716	20	14	309	343	6,059	309		38	347

ARMAMENT AND AMMUNITION.

Officers and sergeant-majors are supposed to be armed with the sword and revolver. Many were seen in the field without the latter, but the former was invariably carried. The swords were of various patterns, an officer sometimes carrying a blade that had belonged to his ancestors, with the hilt made to grasp with both hands. In this matter much sentiment prevailed.

The infantry was armed with the "thirtieth-year rifle."

Rifle:

Weight with bayonet,^a 9 pounds 8½ ounces.

Weight without bayonet, 8 pounds 9½ ounces.

Length with bayonet, 5 feet 5½ inches.

Length without bayonet, 4 feet 2½ inches.

Caliber, 0.256 inch.

Breech action, safety bolt.

Contents of magazine, 5 rounds.

Sights, up to 3,000 meters.

Ammunition:

Weight of cartridge, 348.5 grains.

Powder charge, 32 grains.

Weight of bullet, 162.9 grains.

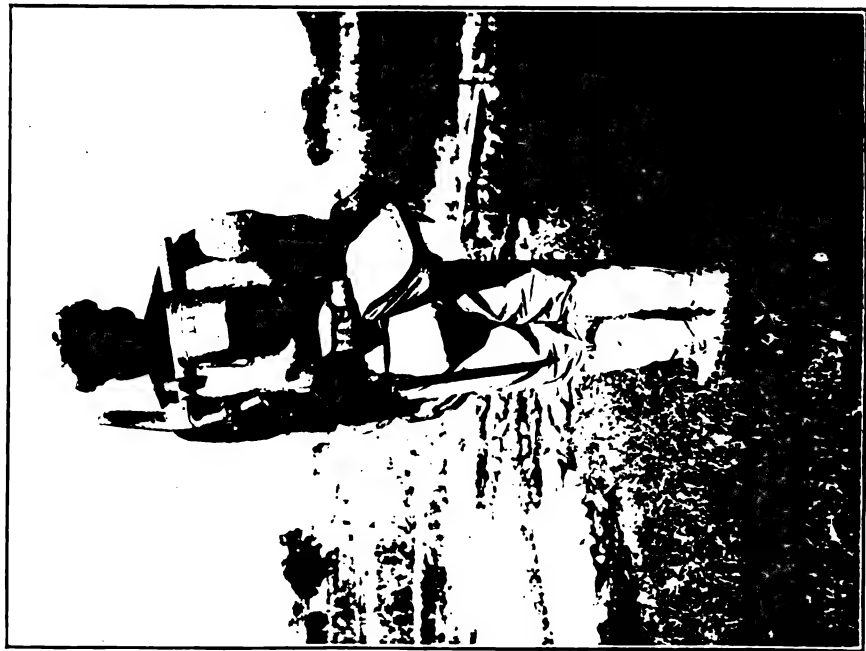
Initial velocity, 2,300 foot-seconds.

^a Sword bayonet.





1. INFANTRYMAN, HEAVY MARCHING ORDER - FRONT VIEW.



2. INFANTRYMAN, HEAVY MARCHING ORDER - SIDE VIEW.

The usual supply of ammunition, per man, in the field is:

	Rounds.
Carried by man.....	120
Carried in battalion transport.....	100
Carried in ammunition column.....	100
Total	320

EQUIPMENT.

The knapsack is made of skin with the hair outside, over a framework of light wood one-half inch thick. The inside dimensions are 11½ inches wide, 10½ inches from top to bottom, and 4½ inches deep (front to back). The back is closed by two side flaps tied together with strings; another flap folds over these from the top and has a lining which serves as a pocket for small articles, such as handkerchiefs, letter paper, etc. A fourth flap, coming from the bottom, secures the contents of the knapsack. The regulations governing what shall be carried in the knapsack are not fixed, or, if so, they were laxly enforced in the field. The following articles were usually found there: One change of underclothing, except socks, of which there were two pairs; a towel, soldier's notebook, letter paper, old letters from home, "housewife," and habitually two days' "iron ration," the name given to the Japanese emergency ration.

The knapsack is fastened to the soldier by means of black leather straps. One passes over each shoulder, and a little below the armpit is connected by a stud to two other straps, one of which fastens to the waist belt in front, and the other passes back and is hooked to the bottom of the knapsack.

The greatcoat, rolled, fits over the top and down each side of the knapsack. The blanket, when carried, is packed in a like way. The shelter tent is rolled on top of the greatcoat. One pair of shoes is carried, one shoe on each side of the knapsack if there be no intrenching tool; if there be one, then the shoes are carried on the right and the intrenching tool on the left.^a The shoes are secured by a strap and buckle.

The waist belt is of black leather, fastened by a plate and catch, and has a loop to support the scabbard of the sword bayonet.

^a See photographs Nos. 1 and 2.

Ammunition is carried on the waist belt in three pouches,^a two containing 30 rounds each, in front, on opposite sides of the waist plate, and a third, at the middle of the back, with 60; total, 120. In anticipation of battle 300 rounds per man were frequently carried, the additional cartridges being placed in the pockets, haversack, or in a bag open at both ends and closed in the middle—in shape not unlike our blanket roll, and worn in the same manner across the shoulder, the ends being closed by strings. It was not always carried. One day's field ration was sometimes placed in this bag, which was made of blue cotton duck.

A small brown canvas haversack is swung over the left shoulder and hangs at the right hip. It is not especially intended to hold rations, although a soldier of his own volition sometimes carried them there. The usual contents were various small articles, such as soap, brush, towel, spare parts of the rifle, etc. In an emergency, as stated above, ammunition may be carried in the haversack, and also iron rations if the knapsack be cast aside for battle.

A mess can (the latest pattern is made of aluminium) is carried at the back of the knapsack in the center.^b Its dimensions in inches are: Height, $5\frac{1}{2}$; width, $6\frac{1}{2}$, and depth (front to rear), $3\frac{1}{4}$. The front is slightly concave to fit against the soft flaps of the knapsack. In form it is not unlike a case for field glasses. It has a removable cover, and immediately below this is a detachable compartment 1 inch deep that serves as a measure for one meal ration of rice and may also be used as a utensil in which to cook vegetables or meat. Below the detachable compartment is another space in which rice is boiled; marks on the side of the lower compartment indicate the amount of water required for both one and two meal rations, the latter being the maximum that can be prepared at one time. The can has a strong wire handle that falls to the front. It is peculiarly adapted to the Japanese rations, and gives entire satisfaction.

The water bottle, made of light metal, is carried at the right hip in a leather pocket fastened to a strap swung over

^a See photographs Nos. 3 and 4.

^b See photographs Nos. 2 and 4.



3. INFANTRYMAN, HEAVY MARCHING ORDER.

the left shoulder. It holds about a pint, or about one-half as much as our canteen. Water can be boiled in it, which is an advantage, but as it has no canvas covering the contents become too warm on a long march in the hot sun to be palatable.

Excepting the knapsack, which is too rigid, the equipments are generally good, but the necessity for adding a heavy pair of shoes to the already weighty load carried by the infantryman is not seen. The inconveniences caused by an occasional broken shoe are of infinitely less importance than those resulting from loading hundreds of men with unnecessary weight. It should be the duty of the supply and transport departments, or, in our service, of the Quartermaster Department, to provide the shoes when needed. The weight to be placed on our men deserves the most careful consideration, especially as modern battle conditions demand that an intrenching tool be carried. Experience tells us that our troops are prone to disencumber themselves on the march of articles not essential to personal safety or of immediate use. General Grant, in his Memoirs, mentions how he was impressed by the number of new overcoats thrown away on the march to the Wilderness, and we know that more than thirty years later our troops in Cuba and in China did likewise. Do we need further lessons? Moreover, we should add a sufficient number of hot and cold water carts to follow the column to insure our men a proper supply of wholesome water. Again, we want an acceptable emergency ration, if that has not already been secured, so as not to require the soldier to carry more than one day's field ration at any time. No effort should be spared to reduce the weight and bulk of his load.

In one respect the Japanese equipment is decidedly superior to our own, as it has nothing dangling against the leg like our long haversack.

INTRENCHING TOOLS.

One tool, either spade, pick, or hatchet, is carried by 50 per cent of the infantry, strapped to the knapsack. The proportion of tools is thought to be about one pick to four shovels. The hatchets are few, and on occasions, at least,

were carried by noncommissioned officers. In the field a full supply of large tools, carried on pack horses, follows each battalion.

The dimensions of the tools carried by the men are as follows:

Spade.—Length, with handle (wooden), $20\frac{1}{2}$ inches. The spade itself is $7\frac{1}{2}$ inches long, 6 inches wide at the bottom, and $6\frac{1}{4}$ at the top, where it is thickened to form a foot rest. Weight $3\frac{1}{2}$ pounds.

~ *Pick*.—Length, 14 inches. It is pointed at one end, with the usual ax-shaped edge at the other. The wooden handle is $17\frac{1}{2}$ inches long. Weight, $3\frac{5}{8}$ pounds.

A leather cover, fastening with a strap and buckle, is provided for each tool. All three stood the service well.

SUPPLIES.

Each man was supposed to carry one day's field ration, but sometimes when conditions were favorable this was carried by the transport. He always carried two days' iron (emergency) rations; the latter are eaten only when so ordered by the commanding officer, and when consumed are replaced at the first opportunity.

The total weight carried by the infantry soldier in full marching order is $56\frac{1}{2}$ pounds.

FIELD TRANSPORT.

The field transport consists of light carts and pack horses, and is furnished by the train battalion of each division.

In the light battalion transport are carried intrenching tools, medical stores, litters, and ammunition. The heavy regimental transport was intended for officers' baggage, one day's supplies, and cooking utensils, but it is thought the necessities of the war frequently interrupted this arrangement. The light transport accompanies the fighting troops. Ammunition is packed in boxes containing usually 1,200 rounds each, but with the machine gun batteries, at least, the boxes sometimes contain but 900 rounds. Two of the larger boxes make a load for a pack pony.

CAVALRY.

ORGANIZATION.

On the outbreak of the war there were thirteen regiments of cavalry, one for each division of infantry, and in addition two brigades of three regiments each. Four new divisions of infantry were formed during the war and presumably each had a regiment of cavalry attached.

Each divisional regiment consists of three squadrons, while those in the cavalry brigades have five squadrons each, the fifth being a depot squadron.

The divisional regiments were, as a rule, at the disposal of the divisional commanders. They were often held for weeks at a time in rear of the divisional infantry, where of course it was impossible for them to perform one of their more important functions, that of serving as eyes to the army, and their numbers were largely depleted by having men detailed away as orderlies. In fact their usefulness was largely frittered away.

The brigades operated as independent cavalry—that is, as a cavalry corps, and, considering their strength, did creditable service. The regiments in the brigades are commanded by colonels, in the divisional cavalry by lieutenant-colonels,^a and the squadrons by captains.

A squadron is divided into four sections for administrative purposes.

The strengths of the squadron on the peace and war footings and of the regiment on the latter footing are as follows:

Peace establishment.

Organization.	Persons.				Horses.			
	Officers.	Noncommissioned officers.	Privates.	Total.	Saddle.	Pack.	Draft.	Total.
Squadron	5	26	109	140	135	.....	.....	135

^a One is believed to be a "candidate" or "probationary" officer.

^a This is the habitual practice for divisional regiments, but late in the war the cavalry of the Guards Division was commanded by Colonel Kase, and there may have been other exceptions.

War establishment.

Organization.	Combatants.				Noncombatants.				Horses.			
	Officers.	Noncommissioned officers.	Privates.	Total.	Officers.	Noncommissioned officers.	Privates.	Total.	Grand total.	Saddle.	Pack.	Draft.
Squadron.....	5	26	110	141			30	30	171	141	30	
Regimental staff....	2	8		10	5	5	3	13	23	23	3	
Three squadrons....	15	78	330	423			90	90	513	423	90	
Total.....	17	86	330	433	5	5	93	103	536	446	93	

ARMAMENT.

The cavalry is armed with sabers, slightly curved, about 36 inches in length, including the hilt. The carbine has the same caliber as the infantry rifle (.256) and is carried slung on the back, without boot or rest of any kind other than the sling.

The revolver is carried by officers, noncommissioned officers, and trumpeters. It is not in general favor, and one colonel said he did not wish for revolvers for the privates and would prefer that the noncommissioned officers who had no carbines had the latter instead of revolvers.

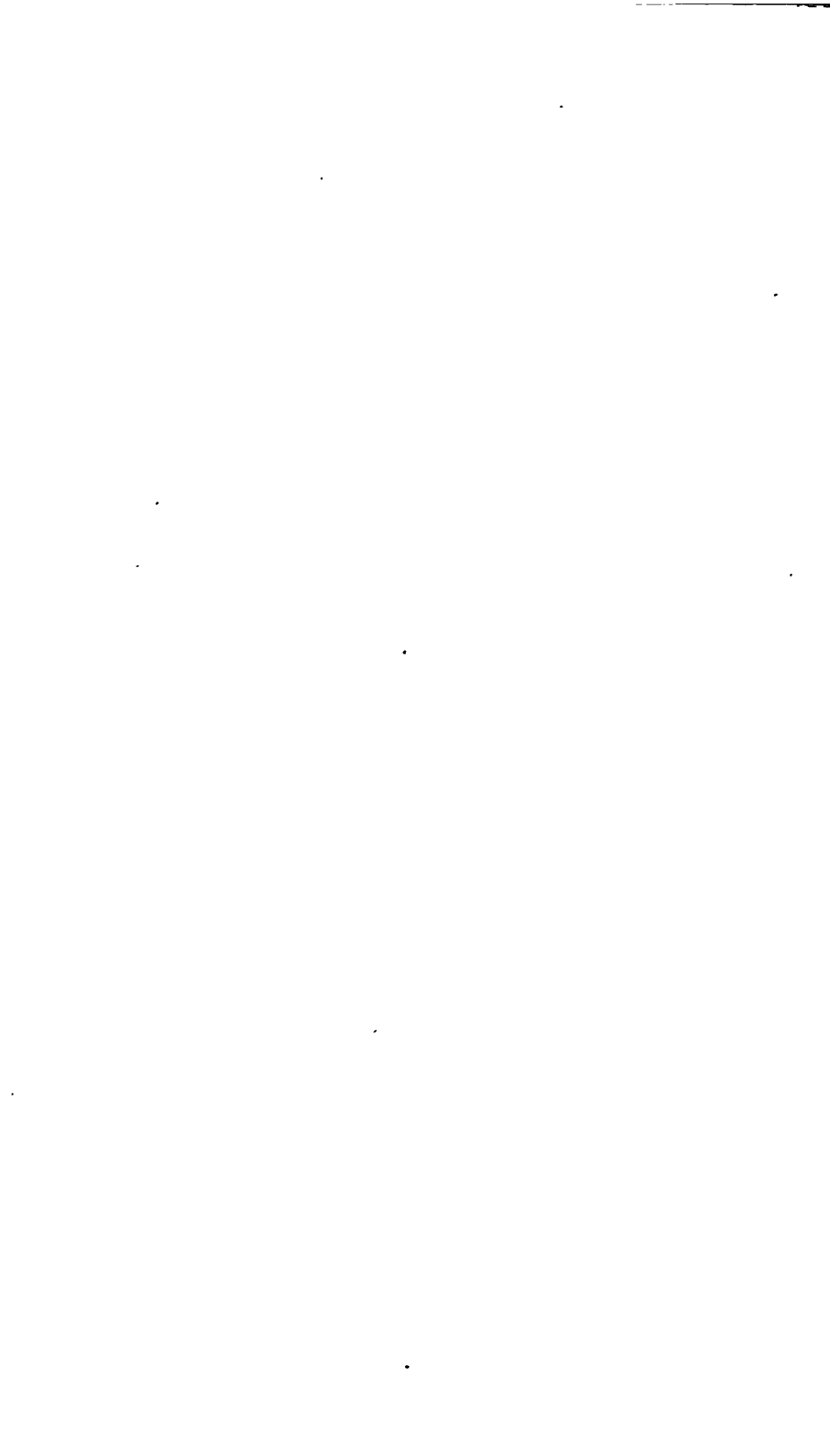
Shortly before the outbreak of the war the number of rounds of carbine ammunition prescribed to be carried by a cavalryman was only 18, but the colonel who commanded the Guards cavalry told me that as the war progressed he was impressed more and more with the importance of fighting on foot, and had largely increased the amount of ammunition carried by the trooper.

The divisional cavalry having no ammunition transport, replenished its supply, when necessary, from an infantry battalion transport or from the ammunition columns. It is understood an ammunition transport was added during the war for each cavalry brigade.



4. INFANTRYMAN, HEAVY MARCHING ORDER.







6. JAPANESE SADDLE TREE AND PAD.



EQUIPMENTS.

The saber is suspended from a waist belt worn under the coat. Clothing and toilet articles are carried in large leather pockets resembling somewhat our old pistol holsters and, like them, placed on either side of the pommel. At the cantle are two other leather pockets to carry horseshoes and nails, and beneath these two larger ones, made of canvas, nearly as large as our saddlebags, and designed principally for forage and rations. A small lariat is carried in a pommel pocket or saddlebag. One day's forage is habitually carried. The nose bag is of flimsy material, with a rope instead of a strap to pass over the head. There is a compressible canvas bucket, which is most useful when the horse is watered from a well, as was frequently done in Manchuria. It is also often used to hold water to wash the horse's legs. The nose bag and bucket are carried at the cantle, resting against the saddlebags.

The saddle, which stands high above the horse's back, does not afford a very secure seat. It is built of two parts, the saddle proper and the pad.^a The latter is detachable and is stuffed with hair, which can be adjusted through an opening. In addition to the pad a blanket was commonly used. There is an arrangement on the cantle to fasten the trooper's blanket and overcoat. The web girth, which is too narrow, is forked at each end so as to fasten with two buckles. Cruppers are much used. The stirrups are of iron. The bridle and halter are separate; the former has two light bits, curb, and snaffle. Frequently the latter alone was used.^b

The weight carried by the cavalry pony, exclusive of the rider, but including arms, ammunition, clothing, rations, and forage, is about 120 pounds. Perhaps 130 pounds is an average weight of the rider.

The officer's saddle closely resembles an ordinary English saddle, but with conveniences added to attach pommel pockets and to strap the overcoat at the cantle.

A comparison between the American and Japanese saddles will be made later.

^a See photographs Nos. 5 and 6.

^b Photographs Nos. 7 and 8 show the trooper and his pony.

ARTILLERY.

FIELD AND MOUNTAIN.

There are both field and mountain batteries. A regiment consists of two battalions of three batteries each—6 guns per battery (36 guns per regiment and 6 horses to a field gun).^a

To each of the original thirteen infantry divisions was attached one regiment of artillery, field or mountain, making a total of 468 guns. It is believed a like assignment was made to the kobi division in the Fifth Army and to each of the four new divisions. Until the close of the war it was difficult to get information about the latter, and even then it was no easy task. In December, 1905, it was stated they had not yet been authorized by the Parliament as permanent organizations. If we give a regiment of artillery to the kobi and to each of the new divisions we must add 180 guns, making a total in the field of 648 in the divisional artillery.

There are also two artillery brigades, each of three regiments of two battalions of three field batteries each, 6 guns per battery; a total of 216 guns in the two brigades, or 864 in the brigades and divisions combined.

In addition to the 864 guns above mentioned, there were 78 more in the kobi brigades attached to each of the thirteen original divisions, thus giving a grand total of 942 in the army.

It is not known if a reserve in the shape of a kobi brigade was added to the kobi division in the Fifth Army and to each of the new divisions, but it is thought not. If five brigades were so added, each with a battery of 6 guns, we must increase the grand total of 942 given above by 30.

The divisional artillery is usually at the disposal of the division commander.

The artillery brigades were employed, as a rule, as independent artillery—that is, as an artillery corps—under the direct control of the commander in the field.

A divisional regiment, with one exception, is composed entirely of either field or mountain guns, but in Manchuria

^a To the heavier guns captured from the Russians 8 horses were attached.

batteries were transferred from one division to another as circumstances dictated.

An artillery regiment is commanded by a colonel, a battalion by a major, and a battery by a captain.

The battery is divided into three platoons and each platoon into two sections. The platoon is commanded by a lieutenant and the section by a sergeant.

The peace strengths of the principal units, as reported something over a year before the outbreak of the war, were as follows:

Peace establishment.

Organization.	Officers.	Noncommissioned officers.	Privates.	Drivers.	Total.
Field battery	5	20	86	16	127
Mountain battery	5	20	86	16	127
Artillery battalion					385

As an explanation of the small number of drivers shown, it may be stated that all soldiers in the field and mountain batteries are instructed both as gunners and drivers.

The war strengths of the principal units are as follows:

War establishment.

Organization.	Combatant.				Noncombatant.				Horses (field batteries).				
	Officers.	Noncommissioned officers.	Privates.	Total.	Officers.	Noncommissioned officers.	Privates.	Total.	Grand total.	Pack.	Draft.	Riding.	Total.
Battery.....	5	20	178	203			25	25	228	25	96	25	146
Battalion staff.....	2	2		4	2	2	1	5	9	1		9	10
Three batteries.....	15	60	534	609			75	75	684	75	288	75	438
Total.....	17	62	534	613	2	2	76	80	693	76	288	84	448
Regimental staff.....	2	2		4	3	2	2	7	11	2		11	13
Two battalions.....	34	124	1,068	1,226	4	4	152	160	1,386	152	576	168	896
Total.....	36	126	1,068	1,230	7	6	154	167	1,397	154	576	179	909

A mountain battery is understood to have 75 instead of 25 pack animals and 8 instead of 96 draft animals; total, 108,

including 25 riding animals. The battalion has, therefore, 226 instead of 76 pack and 24 instead of 288 draft animals; total, 334, including 84 riding animals instead of 448 as in a field battalion. This gives to a regiment of mountain artillery 454 instead of 154 pack and 48 instead of 576 draft animals. Total animals (riding included) 681 instead of 909.

Field guns.—The field piece known as the Arisaka gun, used during the war, is not a quick-fire gun in the present sense of the term. The charge is contained in a brass case, but it is not united with the projectile, and there being no mechanism to take up the recoil, requires that the piece be relaid after each shot. It fired from six to seven shots per minute.

It is understood a new and up-to-date gun is now being made and will soon be issued. No detailed information concerning it could be obtained.

The Arisaka gun has a caliber of 2.95 inches and fires a projectile weighing 11 pounds. Its extreme range when the war commenced was supposed to be 5,500 meters, but later the charge was increased and a range of 6,600 was obtained. Recoil is checked by break shoes on the wheels. These shoes are fastened so as to allow some play by being attached to a steel rope which passes over the axle and back to a spring between the two cheeks of the trail. The gun has a shield above the axle but none below.

The gun, limber, and caisson are shown in photographs herewith.^a The gun limber is of metal and is interchangeable with the caisson limber. It is divided into four trays, each containing ten complete rounds. The caisson limber and caisson body carry like amounts, making a total of 120 rounds. In action one of the trays mentioned with ammunition is placed on the ground near the wheel of the piece.

The Japanese gun was inferior in every way to the Russian, but the superiority of the latter was overbalanced by the skill with which the former was served. A large number of Russian guns were captured, notably at Mukden, and the Japanese promptly manned them, adding a shield both above and below the axle. The ammunition for the Russian gun is fixed. There is a spade attached to the end of the trail.

^a Photographs Nos. 9 and 10.



8. A TROOPER ON HIS MOUNT, FULL PACK.



9. A JAPANESE FIELD PIECE ON THE ROAD NEAR KAIYUAN.





10. A LIMBER CHEST OPEN.



11. "ONE-PONY" CARTS.

and in the latter means are arranged to take up the recoil. The gun is heavier than that of the Japanese, and 8 instead of 6 horses were attached. A Japanese officer commanding one of the captured batteries informed me that he had obtained good results with these guns at 8,000 meters, although the Russians said their extreme range was only 6,600.

Mountain guns.—The Japanese mountain gun has the same caliber as the field gun, but it is much shorter. Its range can not be stated with accuracy, but it is believed to be about 3,500 yards. The gun and carriage are packed on three ponies or drawn by one.

The men are armed, as in the field-gun batteries, with a short straight sword.

AMMUNITION COLUMNS.

These consist of two-wheeled one pony carts* or of pack ponies.

There are four infantry and three artillery ammunition columns with each division.

In the artillery an ammunition battalion is organized on mobilization from reserve artillerymen. It is the duty of this battalion to keep the reserve ammunition with the regimental transport filled up from the ammunition column.

COAST ARTILLERY.

A considerable portion of the coast artillery prior to the war was attached to the different division headquarters for administrative purposes, and the regulations of 1905 continue this arrangement.

The number of battalions in a regiment and of companies in a battalion vary in the different regiments. Two years before the war there were twenty-eight companies in all, with a battalion being formed for Tsushima and another for Sasuna. The increase made during the war, if any, is not known. Fifteen to twenty men in each company are enlisted as "assistant soldiers." They act as military laborers.

Formerly it was usual to hold target practice during three weeks in the autumn, and every man was trained in han-

* See photograph No. 11.

being the different gills in the fortress to which he was attached.

SIEGE ARTILLERY.

The siege artillery is formed from coast artillery as required. Instruction in siege work is given in the coast artillery, and there is a practice school of fortress artillery at Yokosuka (Uraga), previously mentioned.

ENGINEERS.

One battalion (three companies) of engineers is attached to each division. On mobilization two companies are employed as field companies and the third contains two bridge sections, and, if required, a telegraph section. The bridge sections have material for a pontoon bridge 144 meters in length.

The following table shows the strengths of companies, battalions, and sections on a war footing:

War establishment.

ORGANIZATION.	COMBATANT.				NONCOMBATANT.				HORSES.			
	Officers.	Noncommissioned officers.	Privates.	Total.	Officers.	Noncommissioned officers.	Privates.	Total.	Pack.	Draft.	Riding.	Total.
COMPANY.....	1	2	200	203	.....	.....	30	30	251	30	.....	30
BATTALION.....	3	6	.....	9	3	2	4	9	17	4	.....	4
TELEGRAPH SECTION.....	1	2	40	43	.....	.....	60	60	522	60	.....	60
TOTAL.....	5	10	240	255	3	2	64	69	530	64	4	94
TELEGRAPH SECTION.....	.....	.....	.....	.....	7	29	96	132	132	630	31	66
ENGINEER BATTALION.....	.....	.....	.....	.....	5	5	100	110	310	600	11	220

The Japanese telegraph sections were frequently transported on "one-pony" carts, each carrying the material to set up a position.

The portable telegraph is divided into two equal parts, both water-tight. The parts can be separated or kept together on a special cart drawn by one pony, or each half can be further subdivided into three parts and each part carried on a pack pony.

CHAPTER IV.

RAILWAY TROOPS, TRAIN AND TRANSPORT TROOPS, PACK SADDLES, AND TRANSPORT CARTS.

RAILWAY TROOPS. *

Prior to the war the railway battalion at Tokyo consisted of two railway companies and one telegraph company. There was, of course, a great expansion during the war, but how much is not known. In the peace establishment the strength of the railway company was 5 officers, 26 noncommissioned officers, and 96 privates. The telegraph company had the same strength as the telegraph section shown in the table giving the war establishment for engineers.

TRAIN AND TRANSPORT.

In the peace establishment each division of the active army has a train battalion, which forms the nucleus and school of instruction for the regimental and divisional field transport service on the war footing. The instruction given proved to be of the greatest value, for the regulations governing the pack and cart transportation in the field produced the most admirable results. After observing the system and order that prevailed in the transportation of supplies, I feel it my duty to urge on my military superiors the immediate organization of a field transport department, or if that be impracticable, then the formation of a section in the Quartermaster's Department to concern itself alone with the subject of land transportation. It is the system and not the vehicles of the Japanese transport department that is so much to be admired, although their one-pony carts possess certain advantages to be noted later. The officer who superintends the transport department of a division, corps, or an army should not be the same man whose mind is absorbed in procuring and issuing supplies.

In time of peace the divisional train battalion is divided into two companies, and each company into four sections, for administrative purposes. The company has 7 officers, 36 noncommissioned officers, 76 privates, and 240 drivers (transport soldiers). Although the latter are called drivers, they almost invariably lead the pony. A sufficient number of riding, pack, and cart ponies are attached for instruction purposes.

The term of conscription for the train soldier is three years, as in other branches of the active army. The practice in time of peace was to hold the transport soldier for three months and then to give him a furlough; in this way four squads were trained per year, and a large reserve formed. The train and transport soldiers are instructed under the same management.

In the field the train soldiers act as superintendents of the transport columns and are usually mounted; the transport soldiers act as drivers and laborers.

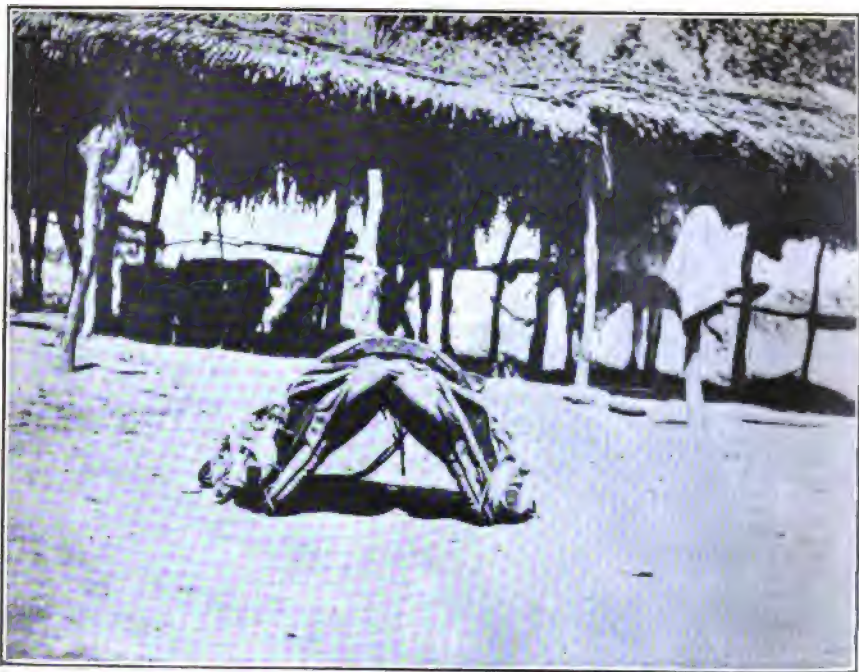
In the earlier part of the war the train soldiers had no rifles; later these were issued as an additional means of defense of the line of communications against attacks by the Russian cavalry.

In time of peace each company has specimens of the different kinds of war material belonging to the train, such as carts, harness, and pack saddles, and of material habitually transported by the train, as cooking utensils, boxes and bags for holding subsistence stores, telegraph stores, pontons, etc., for the purpose of giving practical instruction in loading and packing.

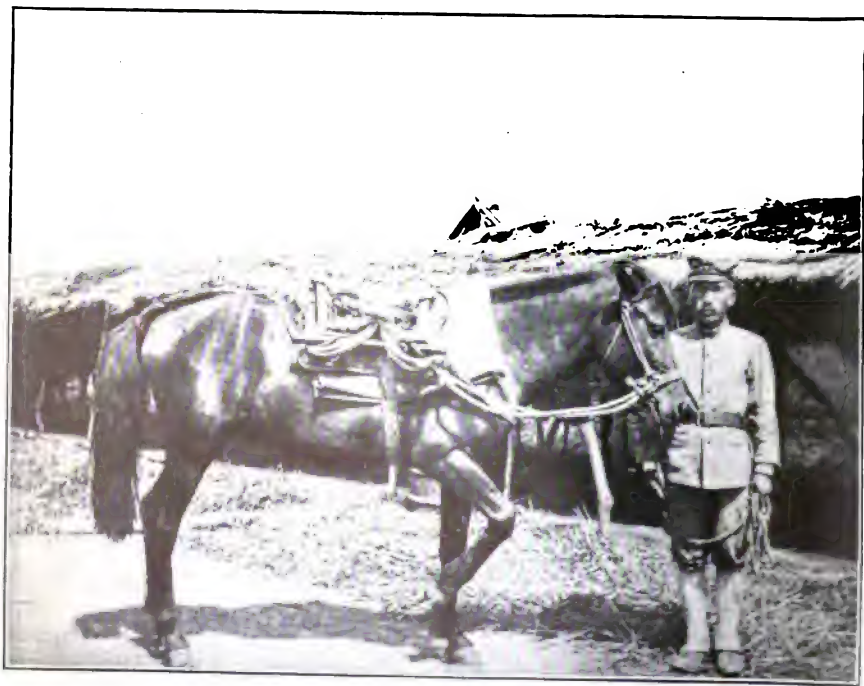
Near the barracks of the train battalion is the train depot, containing the large quantities of stores necessary for mobilizing the transport columns of the division. Here, too, are repair shops for iron and wood work and for saddlery.

The mobilization stores include, among other articles, harness, carts, pack saddles, nose bags, buckets, cooking utensils, and various articles for holding supplies, such as boxes, bags, and matting. They also contain field telegraph equipment, and pontons with the accompanying parts for bridging.

On mobilization the train battalion is largely expanded, but ceases to exist as a separate battalion. It forms the divisional supply columns, and furnishes officers, men, carts,



12. PACK SADDLE, FRONT VIEW, FIELD STABLE IN BACKGROUND.



13. PACK PONY AND SADDLE WITH TRANSPORT SOLDIER.

pack saddles, etc., for the transportation of regimental baggage and stores, and for pontons, hospitals, telegraph sections, and ammunition columns. The expanded battalion has 18 officers, 84 noncommissioned officers, and 1,202 privates; total, 1,304.

The transport saddle ^a is said to weigh about 41 pounds, and the usual load for a pony in addition to the saddle is 200 pounds. The saddle will be described in more detail later. A pack pony carries two days' forage for himself.

The transport cart ^b weighs 270 pounds; it has two wheels, and is intended to carry from 350 to 400 pounds. The platform is 6 feet long and 2½ feet wide, and without sides. It is drawn by one pony. The track of the wheels of those seen in Manchuria was the same as that of the Chinese cart, and this of course was of great advantage. It is believed to be the same as that of the ordinary Japanese jinrickisha. As one man is assigned to each cart, and as its maximum load is only 400 pounds, this transportation would be very expensive in America. It possesses one advantage—it can be taken almost anywhere. Plowed fields after heavy rains will not prevent these carts from following the fighting troops, and I have seen them transporting supplies over roads where one of our four-mule wagons would not live five minutes. A reasonable number of light but strong carts, to be used in an emergency between the wagon trains and fighting troops and around camps, would prove useful in our service. They possess some advantages over pack horses. Such carts would have been invaluable in the Santiago campaign.^c

In Manchuria, the divisional transport train consisted of four supply columns—200 “one-pony carts” in a column. When the army was stationary these carts were frequently used between the “field magazine” (divisional storehouse) and the nearest *étape* depot (a supply forwarding depot). When the army was moving they worked back to the nearest *étape*, or to the approaching Chinese carts; that is, they connected the army with the *étape* line. The operations of the

^a See photographs Nos. 12 and 13.

^b See photograph No. 14.

^c The handcart that was so largely used along lines of communication in the early part of the war was only employed about depots in the spring and summer of 1905.

army in Manchuria can not be properly treated without liberal reference being made to the Chinese cart, which, with the military use made of it, will be described later.

For transportation emergency rations are packed as rations, other supplies separately by weight. Bags made of straw matting are largely used. The boxes, although light, are made strong by surrounding them with matting. A broken package was seldom seen.

As our transport department has always been but a branch of one of our several supply departments, it is difficult for an American officer to at once grasp the idea and working of the Japanese transport or *étape* department, the officers for which are detailed from the line. Perhaps the explanation given by the officer in charge of the *étape* station of the First Army at Kaiyuan will elucidate this subject. He said, "The duty of the *étape* department is to receive supplies and to forward them to the 'field magazine,' where they come under the direction of the division commander, represented by his chief intendant, who distributes them by means of the division trains to the battalions. If stores have to be bought in the field, they are purchased by the intendants department and are then turned over to the *étape* officer for transportation and delivery. To make such purchases there is a paymaster (intendant)^a attached to each *étape* depot. Supplies are either sent from the general depots in Japan or bought here (Manchuria). Officers of the intendants department buy supplies in Japan as well as in Manchuria."

As previously stated, each soldier in the field carries one day's field ration and two days' emergency rations. In theory, at least, the regimental transport and divisional transport columns combined carry five days' more. This regulation was perhaps more honored in the breach than in observance.

^a The junior officers of the Intendants department, captains and lieutenants, are frequently, if not usually, spoken of as paymasters.

CHAPTER V.

DEPARTMENTS AND REMOUNT SERVICE.

MEDICAL DEPARTMENT.

Officers of the medical service are drawn principally from the graduates of the medical school of the university (civil). Subsequently they are required to take the course at the Army Medical School.

During the war many surgeons were taken from civil life, who were to return thereto after demobilization. They served indiscriminately both with the active army and kobi reserve,^a but as far as practicable in hospitals.

Surgeons were also recruited from "one year volunteers," who joined in time of peace, and who were licensed to practice medicine.

Medical officers are classed as noncombatants, but they have relative rank, lieutenant-general being the highest grade.

ORGANIZATION IN TIME OF WAR.

In each division in time of war there is a medical detachment, from three to six field hospitals, two sanitary (bearer) companies, and a proper proportion of riding and baggage horses.

This is, perhaps, as good a place as any to give a general outline of how the different hospital stations are established to meet the emergencies of battle.

TROOP DRESSING STATIONS.

As the battalion advances the surgeon generally establishes a dressing station, to which the wounded are carried by the company bearers. Here the first-aid bandages are examined

^a This statement is not intended to imply that the kobi troops did not actively participate in the campaign.

and repaired if necessary. The station should be under cover from the enemy's fire, in the vicinity of good water if practicable, and in warm weather in the shade.

PRINCIPAL DRESSING STATIONS.

The wounded are carried by the bearers of the sanitary company from the troop dressing station to the principal dressing station (which should be established with the same considerations for avoiding fire and securing water and shade as are mentioned above for the first), thus releasing the battalion surgeon and company bearers and permitting them to rejoin their battalion. If there be no troop dressing station the bearers of the sanitary company carry the wounded from the firing line to the principal dressing station, where there may be one-half, or even an entire sanitary company, if but a part of the division is engaged. At the principal dressing station the wounded receive such further medical attention as may be necessary before being transferred to the field hospital.

FIELD HOSPITALS.

As the fight grows a field hospital is established, and then a second, and so on. These receive the patients from the principal dressing stations and give further and if practicable more satisfactory treatment.

A soldier sent to the field hospital has his rifle and equipments tagged there.

STATIONARY FIELD HOSPITAL.

A stationary field hospital should, if practicable, be located near the line of communications. It receives patients from the field hospital, the place of which it takes, so as to permit the latter to advance. It is not, like the field hospital, intended to move with the fighting line, but to receive patients at a fixed place and to give them regular hospital treatment until they can be sent back for final care at the permanent hospital somewhere on the line of communications, or, as it was usually termed, the *étape* line.

The principal dressing stations and field hospitals are, if practicable, established near streams and in villages, although the amputations may be made under canvas. The

stationary and permanent hospitals in Manchuria were almost necessarily located in villages. When the stationary hospital is emptied of its patients it is discontinued.

Thus we find the troop dressing station being relieved by the principal dressing station, the latter by the field hospital, and this in turn by the stationary field hospital. As each is relieved it advances and rejoins the troops.

HOSPITAL SHIPS.

These are furnished when there is suitable water communication. In the recent war there were, it is understood, 22 supplied by the Government and 2 by the Red Cross Society. I visited one of the former in Dalny Harbor. This ship fell far short of our hospital ship *Relief* in conveniences and comforts. The bunks were all double tier; the ward-rooms were clean, but not well ventilated. There were two cells in which to confine the insane. Women were aboard as nurses.

TRANSPORTATION OF SICK AND WOUNDED BY RAILWAY TRAIN.

The ordinary box cars were used, and each patient laid on the floor with usually only a piece of matting under a single blanket. The men were packed in. There were no toilet facilities or closets, and the sick were helped out of the cars by the hospital corps attendants, or scrambled out as best they could to attend to the calls of nature. The period referred to was in the spring and summer of 1905, when there were no great battles with their thousands of wounded. Doubtless many of the patients were convalescents, but I saw hundreds transported in this way who were carried on litters to the cars and who had to be lifted in by the attendants.

AMBULANCES.

I saw no ambulances with the Japanese army. The sick and wounded were transported from place to place on hand litters, commonly carried by Chinese peasants.

INTENDANCE AND PAY DEPARTMENT.

Officers of the intendance and pay department are recruited from volunteers from civil life or from the army at

large. Under the provisions of existing regulations candidates for entrance to the corps must be about 20 years of age and must first serve six months as a soldier. They then enter a special school for two years, and after passing a satisfactory examination are appointed sublieutenants. At the said school they are educated to fill the lower grades in the department. Their advancement to include the grade of captain is made in accordance with the general regulations governing promotion. Officers to fill the higher grades are selected from the lieutenants and captains of the corps on the recommendation of the division commander. If, after thus being selected, they pass the required examination, they are sent to a special school, where the course lasts at least one year.

Officers of this department are classed as noncombatants, but have relative military rank. The inspector-general of intendance ranks with a lieutenant-general.

The duties deal with pay, contracts, and supplies, both clothing and subsistence being included among others. The officers have nothing to do with transportation.

On the staff of a division commander in time of war there is a chief intendant, who has general charge of the accounts and supplies of the division.

With each unit (battalion in infantry) there is an intendant, usually called paymaster, who deals with pay, clothing, and rations. He makes requisition for rations, obtains them from the divisional field magazine or from the supply columns, and superintends their distribution to the companies.

DEPARTMENT OF ARMY TRANSPORTATION.

This department is distinct from the intendance department; that is, it is not connected with the purchase of supplies. It has control of both land and ocean transportation, and judging its organization from the results obtained, that is from the smoothness with which troops were transported to the theater of operations and all kinds of supplies delivered therein, we must admit that it was good, and I am of the opinion that the Japanese idea of making this a distinct department is correct, and should be adopted in our Army. The officers are detailed from the line.

JUDICIAL DEPARTMENT.

This department deals with military justice and prisons, and, so far as could be determined, has duties similar to the like department in our service.

VETERINARY DEPARTMENT.

The officers of this department are recruited from graduates of the veterinary school. They are classed as noncombatants, and have a hierarchy of their own, the highest grade being that of colonel.

REMOUNT SERVICE.

The Japanese horse, or pony, is an inferior animal for military purposes, a fact that is well appreciated by the cavalry and artillery officers. As a pack pony he answers fairly well. He is usually ill formed, with poor action, and is frequently weak forward, so that when he trips he is apt to go down on his nose. On one occasion when I was visiting a cavalry regiment the lieutenant-colonel commanding said he knew they were poorly mounted, and added he was ashamed to show such horses. Those of this regiment probably averaged 14½ hands in height and from 775 to 800 pounds in weight. The best horses seen were in the Fifteenth Artillery, Colonel Shiba's. They were about the same size as those just mentioned, but had evidently been selected with more care, and might be classed as first-class ponies.

The Japanese Government is fully alive to the military needs of the country and is making strenuous efforts to repair the deficiency both as regards the number and the quality of the animals used for military purposes. Studs have been established and prizes are awarded to the breeders who rear good stock. The Government reserves to itself the right to buy, at market prices, any animals suited to military purposes.

Horses were imported during the war from Australia in considerable numbers, but not sufficient to make a pronounced impression in the army.

On one occasion the "central horse depot," near Tokyo, was visited. Horses are kept and trained there for military purposes.

At the time of the visit there were 600 on hand, most of them Australian, with a few Japanese and American. The latter were ungainly, heavy brutes, intended for artillery. I was at loss to understand why such clumsy animals had been bought and where they were purchased. They may have come from Canada. They were much inferior to any horses I ever saw in our field batteries. The Australians were not bad, and would compare quite favorably with our cavalry horses; in general, they show a little higher breeding. They (the Australians) had been at the station about six months. When received they were wild, and much run down by their long ocean voyage, but they had been put in fine condition at the depot, where they were carefully trained under the supervision of officers and noncommissioned officers, by 85 men selected from civil life who were supposed to be expert horsemen. This careful and systematic training and seasoning of the green horse before putting him to work with troops might well be copied in our service.

In addition to the depot at Tokyo, it is understood there are seven others in Japan, where horses are trained for a year before being turned over to the troops.

There are four good riding halls at the depot near Tokyo.

The ages of horses purchased in Australia, strange as this may seem, varied, according to statement, from 4 to 15 years. The average age was 7 years. It was said that this was partly due to the fact that these animals were bought on the range where it was difficult to determine their ages accurately, but the conversation disclosed the fact that an age of 10 or more years in a horse is not a serious objection to his purchase.

The extremes of height prescribed for pack ponies and cavalry horses are from $13\frac{1}{4}$ to $15\frac{1}{2}$ hands. Cavalry horses of American or Australian blood should weigh, in order to meet the requirements of the Japanese regulations, from 811 to 952 pounds. Artillery horses from the same countries should weigh about 1,118 pounds.

There are still many stallions left in the military service, but it is intended to get rid of them as fast as practicable.

At the central horse depot many soldiers were seen undergoing instruction in horseshoeing.

CHAPTER VI.

COMPOSITION OF A DIVISION AND OF A KOBİ BRIGADE; GENERAL

DUTIES OF DIVISION COMMANDER; GENDARMERIE.

DIVISION.

PEACE FOOTING.

Two infantry brigades, each of 2 regiments of 3 battalions of 4 companies.

One cavalry regiment of 3 squadrons.

One artillery regiment, field or mountain, of 2 battalions of 3 batteries of 6 guns; 36 guns.

One engineer battalion of 3 companies.

One train battalion of 2 companies.

WAR FOOTING.

The composition of the infantry, cavalry, and artillery of the division is as shown above. The remainder of the division is composed as follows:

One engineer battalion of 2 field companies and 1 company divided into a telegraph section, and a bridge section with pontoon matériel for a bridge of 144 meters.

One medical detachment.

Three to 6 field hospitals.

Seven ammunition columns; 4 infantry, 3 artillery.

One train battalion, of 4 supply columns.

One horse depot.

The strengths of the principal units of a mobilized division are as shown in the following table:

War establishment, mobilized division.^a

Organization.	Combatant.				Noncombatant.				Grand total.	Animals.			
	Officers.	Noncommissioned officers.	Privates.	Total.	Officers.	Noncommissioned officers.	Privates.	Total.		Pack. ^b	Draft.	Riding.	Total.
Divisional staff.....	8	17	32	57	17	14	30	61	118	30	...	56	80
Infantry, 2 brigades.....	278	1,554	9,600	11,432	40	28	618	686	12,118	618	...	76	694
Cavalry, 1 regiment.....	17	86	330	433	5	5	93	103	536	93	...	446	339
Artillery, 1 regiment.....	36	126	1,068	1,230	7	6	154	167	1,397	154	576	179	909
Engineers:													
1 battalion.....	12	58	400	470	3	2	64	69	539	64	...	4	68
Telegraph section.....					7	29	96	132	132	30	...	36	66
Bridging section.....					5	5	300	310	310	200	...	10	210
Train, 1 battalion.....					18	84	1,202	1,304	1,304	1,202	...	102	1,304
Medical:													
Sanitary detach- ment.....					13	60	330	403	403	40	...	10	50
6 field hospitals.....					42	54	800	696	696	300	...	42	342
Reserve ammunition:													
1 ammunition bat- talion.....					12	23	402	437	437	2	...	13	15
3 artillery columns.....					8	26	400	434	434	400	...	34	434
4 infantry columns.....					16	64	800	880	880	800	...	80	880
Line of communica- tions staff.....					3	5	10	18	18	...	...	8	8
Total.....	351	1,841	11,430	13,622	196	405	5,099	5,700	19,322	3,933	576	1,090	5,599

^a This table gives the normal strength of a mobilized division. During the war it of course varied. In the spring and summer of 1905 there were persistent rumors that the combatant strength was considerably larger than as shown above. It was stated the Japanese invariably anticipated their losses in battle, and had brought forward a large number of trained conscripts to replace those who would be killed or wounded in the great battle that was expected to follow Mukden, but which did not take place. However, they kept their secrets well, and it is not probable that the actual strength was known to any but the higher officers.

^b This column also includes the ponies attached to the "one-pony carts."

KOBİ BRIGADE.

On mobilization, as a reserve for each division, there is formed one brigade from the "kobi" (second reserve). It was intended that this brigade should be composed of all arms, yet it is believed the cavalry squadron was not formed, or, if so, but in a few instances. The following gives approximately the combatant organization:

Organization.	Number.	Officers.	Men.
Infantry brigade	1	139	5,577
Cavalry squadron	1	5	136
Battery of artillery	1	5	198
Engineer company	1	5	226
Total		154	6,137

REMARKS.

Thus each mobilized division has, as a normal strength, about 14,000 men in the first line and 6,000 in reserve.

The active army consists of 17 divisions (the Imperial Guards Division and 16 line divisions), with 2 cavalry and 2 artillery brigades, in addition to the divisional cavalry and artillery. The Thirteenth, Fourteenth, Fifteenth, and Sixteenth divisions were raised during the war, and when the writer left Japan, December, 1905, they had not yet been authorized as permanent organizations by the Parliament.

The division commander holds an important position both in peace and war. In time of peace he is required to satisfy himself, by periodical and other inspections, that all the machinery for mobilization in his divisional district is in good working order. It is also his duty to see that the supplies necessary for the mobilization of his division are kept on hand and well cared for. This is desirable decentralization, and it relieves the war department in Tokyo of enormous pressure on the outbreak of war. In war his duties are both tactical and administrative, for the division and not army headquarters secure and distribute the necessary supplies of all kinds.

GENDARMERIE.

The gendarmerie is selected from the army at large. They receive better pay and are granted more privileges than other

soldiers and are not required to live in barracks. Each man is armed with a cavalry saber and a revolver.

Candidates for admission to this force must have had at least two years' service. On receiving an appointment the man is required to take a ten months' course of instruction, principally in law and police regulations.

I was favorably impressed by these trained military policemen, who maintain order and assist discipline in many ways. If a disorder occur or be threatened, they act at once, just as policemen in one of our cities would do. By acting promptly they suppress little disturbances, that might grow in importance if not checked, until a corporal's guard is formed and marched to the scene of trouble. Men of all branches are subject to arrest by them, and habit causes the soldier to recognize their authority, just as we acknowledge that of our civil policemen. The gendarmerie materially reduces the amount of interior guard duty that would otherwise be required.

CHAPTER VII.

ADMINISTRATION ; STAFF ORGANIZATION, AND STAFF OFFICERS.

COUNCIL OF MARSHALS.

This consists of the marshals of the army and navy, on whom the title of field marshal has been conferred by the Emperor,^a the chief of staff of the army, and the corresponding officer in the navy. This council is the highest advisory body on military affairs, and its members may be deputed by the Emperor to inspect the army or navy.

WAR DEPARTMENT.

The minister of war is in charge of all matters pertaining to administration, organization, and personnel, and of the military affairs of the army generally. In his office are colonels, lieutenant-colonels, majors, and captains, each arm of the service being represented, who perform the duties of adjutants and private secretaries. There is also an inspection office belonging to the intendance or pay department, the officers of which have supervision over the financial affairs of the war department in general and of each division.

The minister of war is selected from among the generals or lieutenant-generals of the army and the assistant minister from the lieutenant-generals or major-generals.

In the war department there are five principal subdivisions:

1. Personnel.
2. Military affairs.
3. Intendance.
4. Medical.
5. Judicial affairs, under a judge-advocate-general.

^a In the Japanese language the titles for army and navy officers are the same for like grades.

The chief of the personnel division is taken from among the major-generals of the army, and the chief of military affairs from among the major-generals or lieutenant-generals.

The minister of war holds tri-weekly councils with the assistant minister and the chiefs of the subdivisions mentioned. This arrangement, while giving considerable freedom of action to the minister's principal subordinates, insures at the same time unity of purpose.

The chief of the intelligence and medical divisions are selected from among the major-generals or lieutenant-generals of their respective corps, and each is responsible for the management of his department to the minister.

In the war department there is kept a "daily record" book in which letters received are entered and numbered before being sent to the subdivision to which they properly pertain. A similar book is kept at all headquarters down to and including those of the battalion and plays an important part in army affairs. In the field there is entered in the "daily record" in addition to letters received and sent, notes giving the substance of all the important events of the day with which the particular headquarters are directly concerned. It is examined daily by the commanding officer, who certifies to its correctness by adding his signature or official seal. These books will enable correct history to be written.

PERSONNEL DIVISION.

In this division there are two principal sections. The first deals with promotions, commissions, appointments, increases in pay, records of service of officers and warrant officers, etc. The second section concerns itself with the distribution of medals, prizes and rewards, and also with pensions.

CHIEF OF MILITARY AFFAIRS.

This division is subdivided into—

- a. Section of military affairs.
- b. Section of infantry.
- c. Section of cavalry.
- d. Section of artillery.
- e. Section of engineers.
- f. Section of arms.

Section (a) deals with matters relating to—

1. Organization and establishment.
2. Mobilization.
3. Education; training, and inspection of troops.
4. Discipline.
5. Certain schools.
6. Troops stationed abroad.
7. Ceremonies and uniforms.

The duties of the other sections are sufficiently implied by their names.

INTENDANCE DIVISION.

The following are some of the more important matters with which the intendance division deals: Army budgets, expenditures connected with plans for mobilization, examination of disbursements and accounts, regulations governing pay and allowances, education and appointment of officers of the intendance department, regulations governing the purchase of subsistence stores, forage, and clothing; the hire of buildings and grounds for the use of troops, etc.

The medical and judicial divisions deal with technical subjects, and each is conveniently subdivided for administrative purposes.

CHIEF OF THE GENERAL STAFF.

The chief of the general staff is selected by the Emperor from among the generals or lieutenant-generals of the line, and he is directly subordinate to the Sovereign. He drafts orders relating to the movement of troops, national defense, and mobilization, and, if they be approved by the Emperor, transmits them to the minister of war; he also supervises the staff college and land-surveying department.

There is an assistant chief of staff, selected from the major-generals or lieutenant-generals of the line.

GENERAL STAFF OFFICE.

Under the chief of staff are established the following sections of the general staff:

- (a) 1. Operations of campaign.
2. Supply of provisions for fortified places.
3. Location of troops.

- (b) 1. Organization, peace and war footing.
- 2. Mobilization.
- 3. Arms, ammunition, and material.
- 4. Special regulations for time of war.
- (c) 1. Military statistics.
- 2. Geography of foreign countries.
- 3. Intelligence from spies.
- (d) 1. Transportation and communications.
- 2. Military correspondence.
- (e) 1. History of campaigns in which Japanese troops engaged.
- 2. Military translations.

There is also an adjutant's section, and another dealing with military attachés abroad.

STAFF OFFICERS.

Under the chief of staff, staff officers are divided into two general classes, general staff officers and adjutants.

They are selected from the captains, and those of higher grades, graduates of the staff college, who after graduation have served at least one year with a regiment; or from officers who, in the opinion of the chief of staff, possess special qualifications for staff duty.

Upon each promotion the officer is required to serve one year with a regiment, and they may also be directed to serve with any arm for two months in each year. They are changed frequently from one duty in the staff to another in order to make them familiar with many.

The duties of the general staff officers include among others the general preparations for war, embracing schemes for mobilization, plans of defense and campaign, training and maneuvers, geography, topography, transport, and communication.

The adjutants deal with the preparation and issuance of daily orders and reports, correspondence, investigation of numbers of reserves, horses, arms, ammunition, etc.

The names of officers selected to fill future staff appointments are recorded at army headquarters, with the particular duty each is to perform, and officers selected to fill the more important positions are frequently informed in advance in

what manner their services may be required. This is an admirable plan and might be incorporated with great advantage in our system for detailing staff officers in time of peace, and more especially as a preliminary for raising volunteers for war. It would not only enable the officer selected to prepare himself in a measure for his new duties, but it also would relieve the War Department of enormous pressure, political and otherwise, on the outbreak of war in selecting officers for positions in the volunteer service, a labor that has on several occasions largely helped to paralyze the Department.

In Manchuria, at the grand army headquarters (Marshal Oyama's) the chief of staff had the rank of general; at the headquarters of subordinate armies—First, Second, and so on—he was a major-general, and in divisions a colonel.

CHAPTER VIII.

ARSENALS, FACTORIES, AND DEPOTS.

In the establishment and equipment of arsenals, factories, and depots, Japan has taken the same wise precautions that have been noted in other military preparations.

ARSENALS.

There are arsenals at Tokyo and Osaka, and minor ones at Taipoh, Formoso, and at Moji. At Tokyo there are:

1. Small-arms factory.
2. Laboratory.
3. Ammunition (small arms) factory.
4. Powder mills.

The Osaka arsenal manufactures large caliber guns, ammunition, fuzes, and carriages.

There is a steel foundry at Yedamitsu.

CLOTHING, CLOTHING FACTORIES, AND DEPOTS.

There is a government woolen factory at Senji, a suburb of Tokyo. Wool is imported from Australia, China, and India, and made into cloth at Senji. There are also five private firms that supply cloth for the army—two at Osaka and three at Tokyo. It is said their combined output is less than that of the Senji factory.

The main clothing depot is at Tokyo, with branches at Osaka and Hiroshima.

With the exception of woolen underclothing and cotton and woolen socks and gloves, clothing (including boots and shoes) is made up at the depots in Tokyo and Osaka, or is bought in relatively small quantities from private firms. Woolen uniforms are principally made up at the Tokyo and cotton uniforms at the Osaka depot. In November, 1905, 2,500 employees (men, women, and children—comparatively few of the latter) were working in the Tokyo depot, and it

was said that during the war the number varied from 3,500 to 4,000. When running at full capacity this depot can turn out 30,000 uniforms, and 100,000 pairs of shoes or 60,000 pairs of boots per month. In the same way the Osaka depot can supply 120,000 pairs of shoes or 70,000 pairs of boots in a like period. American cotton and leather are preferred. The underclothing intended for cold weather is good. Knapsacks are made at the Tokyo depot.

Because of the large stock of old uniforms on hand, it is not expected to provide all the troops with the newly adopted olive-drab uniform before 1908. This remark is not intended to apply to the khaki uniform,^a for summer use, which was worn in Manchuria. It is understood the old dark blue cloth uniform will be retained as the full dress.

To prevent the coat collar being soiled by perspiration, a cotton cloth is worn around the neck in warm weather as a substitute for a collar. In shape it is an isosceles triangle, with a base of 24 and a height of 18 inches. The cloth is tied or pinned in front and solves what is a vexed question in our service.

The caps (dark blue, olive drab and khaki) are light weight, with a red band for the guards, and a yellow one for other troops. In warm weather the field cap is furnished with a cotton covering (khaki), from which are suspended three tails to protect the back and sides of the neck from the sun.

The shoe for summer weather is low; for cooler seasons high. Both have hobnails in the soles to prevent slipping, and iron plates around the edges of the heel and toe. Boots are issued to mounted troops.

The overcoat worn in Manchuria was of dark blue cloth, with a hood. After a time a long cotton (khaki) coat was furnished to wear over the great coat to render the latter less conspicuous. This thin coat was also worn at times in sum-

^a The cotton for khaki clothing was most carefully selected and held its color well. Sixteen pieces were seen that had undergone the following tests: Exposure for one hundred and twenty days to the weather and sun, 8 tests with acid and by boiling, 8 washings in cold water with soap. From these 16 pieces, among which were several of American manufacture, 2 of Japanese, and 1 of English make were chosen.

mer over the shirt only; it was said to be waterproof, but it is believed it will turn a light shower only. The newly adopted overcoat is olive drab in color, and it has a detachable fur collar.

The blanket with which the Japanese entered the war was red, but later khaki-colored blankets were issued in part, and all will be made in the latter color hereafter.

A woolen cap, or bag, in form like our former "canvas helmet, blanket lined," covering the head, ears, and neck, is issued for winter service in Manchuria or other cold climates, as are also woolen and fur mits, and a fur body coat that is worn under the overcoat.

During a visit to the Tokyo clothing depot, I saw the fur mits and coats on hand being placed in bundles, pressed and covered with sacking, "to be put away for the next war, about thirty years hence," according to the expressed opinion of the officer in charge. Camphor was used in large quantities as a preventive against moths. With the exception of a few shoes no stores were boxed, but all were neatly piled, and uniforms and cloths carefully covered with light canvas. The buildings were kept scrupulously clean and were well aired. System and care were stamped all over the depot.

SUBSISTENCE STORES AND SUBSISTENCE DEPOTS.

The Japanese field ration is as follows:

Rice	pints	1. 90
or hoshii (dried rice)	do	1. 58
or soft bread	pounds	2. 25
or hard bread	do	1. 50
Meat, canned, beef, fish, or pork	ounces	5. 29
or meat or fish, salted, dried, or smoked	do	3. 97
or meat, fresh, without bone	do	9. 26
or meat, fresh, with bone	do	11. 90
Vegetables, desiccated	do	3. 97
or vegetables, fresh	do	15. 87
Pickles (dried plums, pickled)	do	1. 32
or pickles, fresh, salted	do	1. 98
Seasoning components, extract of soy	do	. 66
or seasoning components, miso (sauce made of fermented beans)	ounces	. 66
Salt, pressed into small cubes, 1 per ration	do	. 40
Sugar	do	. 40

Tea, small cakes, and cigarettes are issued occasionally, as on holidays, for instance, upon the order of the division commander. Sake, a Japanese liquor, containing from 11 to 14 per cent of alcohol, is frequently issued twice a week, but the issue in the field at least depends largely on the will of the division commander, who sometimes increases the quantity in cold and diminishes it in warm weather. The usual weekly allowance is two-thirds of a pint.

Iron (emergency) ration:

Dried rice (hoshii).....	pint..	0. 95
or hard bread.....	pounds..	1. 50
Canned meat.....	ounces..	5. 20
Salt	do.....	. 40

The figures * given above were furnished by direction of the officer in charge of the subsistence depot, Tokyo, where a visit was arranged for me by the war department.

Hard bread is put up in strong tissue paper, three crackers in a package, and two packages tied together. The soldier carries it in this shape, and it seldom breaks. It was said that hard bread would be retained as part of the field ration, but that it would not be issued in garrison, as the Japanese soldier does not like it.

There are four large food (subsistence) depots in Japan, the main one being at Tokyo and the others at Osaka, Moji, and Ujina, the latter being the principal port for embarkation for foreign service.

The principal meat-canning establishments are at Tokyo, Osaka, Moji, Hiroshima, Nagoya, Okayama, Kyoto, and Kuyuchu. Beef, fish, and fowl are canned. At times during the war the main factory located at the subsistence depot, Tokyo, killed and canned 100 head of beef per day. The output of the other military packing houses was not learned. During the time of hostilities large purchases of canned meats were also made from native firms, and some from abroad. It was positively stated by the officer in charge of the subsistence depot, Tokyo, that the greater portion of the canned meats consumed by the armies in Manchuria was

* In calculating the weights of the different components of the ration a pound of 120.95 " mommes " was taken.

of home production. The necessary cans are manufactured at the depots, and each holds one ration.

The cattle seen at the Tokyo depot awaiting slaughter were large and in excellent condition.

ARMS DEPOTS.

In addition to the supplies needed for current issues, the arms depots contain the reserves of arms.

MEDICAL STORES DEPOTS.

It is understood medical stores depots are organized on the same lines as arms and supply depots.

CHAPTER IX.

ANNUAL TRAINING AND MANEUVERS; MOBILIZATION AND CALLING OUT FOR EXERCISE AND TRAINING.

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Company drill.

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In the second and third years the foregoing training was repeated and made more complete.

The allowance of rifle-ball cartridges for each officer and noncommissioned officer in the active army was 120 rounds per year and for each private 125 rounds. In the first reserve each officer, noncommissioned officer, and private fired 40 rounds and in the second reserve 26 rounds.

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It seems probable that in Japan the autumn maneuvers of the future will be increased rather than decreased in importance.

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Staff rides were held annually by selected staff officers under the command of a general officer.

MOBILIZATION.

When mobilization takes place the peace establishment with the colors—that is, the *genyeki*, or active army—is increased to war strength by drafts made upon the *yobi* (first reserve) and at the headquarters of each regiment an additional battalion, squadron, or battery (according to the arm) is formed for depot purposes. A depot is also formed for each battalion of the train. These depots take all the partially trained men who have been called to the colors and those in the active army and first reserve who may be temporarily physically unfit for field service, carry on their instruction, continue the enrollment and training of recruits, and hold

detachments ready to forward to the field to replace losses, either anticipated or actually existing.

Simultaneously with the increase in number of the active army, additional units are formed from the kobi (second reserve) to the extent of one brigade for each division. As previously stated this kobi brigade was intended to consist of 2 regiments of infantry, 1 squadron of cavalry, 1 battery of artillery, and 1 company of engineers, but it is not believed the cavalry was organized, save in a few, if any, instances, in the war with Russia.

It will be recalled the kobi reserve is composed of men who have served three years in the active army (*genyeki*) and four and one-third years in the first reserve, and thus it will be seen that this brigade adds an efficient fighting unit to the division.

Mobilization is completed by calling out the national army, from which a few organizations were formed in the last (Russian) war, and these, it was claimed, were called out more to test the system than because of any difficulty in finding sufficient men in the conscript reserve.

REGULATIONS FOR CALLING OUT THE RESERVES.

The following are the more important regulations included under this head:

The divisional commander, in compliance with instructions, issues the necessary orders to summon the officers and men, whether of the regular reserves or of the national army, who are domiciled in his divisional district, both for inspection and on mobilization.

On divisional commanders is imposed the duty of requiring the machinery for mobilization in their respective districts to be kept in good working order. Similarly, chiefs of local and metropolitan police and commanders of *gendarmierie* will satisfy themselves that all the details connected with mobilization that are placed under their respective jurisdictions are observed and ready to be applied at a moment's notice.

When the reserves are called out, either for inspection or on mobilization, written notices of the date and place of assembly are issued.

The expression "officers and men at home" as used in the regulations from which we quote includes officers and those who rank as such, warrant and noncommissioned officers, and privates who are in the first (yobi) or second (kobi) reserve, as well as all men on furlough and those in the conscript reserve.

When the provisions of the prescribed regulations can not be literally applied, appropriate methods may be substituted by the division commander.

CALLING OUT ON MOBILIZATION.

Calling out on mobilization implies the calling out of "officers and men at home" in sufficient numbers to bring the designated corps up to the prescribed war strength.

On mobilization it is made the duty of local governors to designate certain hotels and houses for quartering the reserves.

The machinery for mobilizing is put in motion by an order, and divisional commanders forward such orders to commanders of regimental districts, and inform local governors and the chiefs of the gendarmerie of their dispatch.

On the receipt of mobilization orders, commanders of regimental districts transmit the necessary information to district chiefs, to whom they send lists of those men who are to be called out and of those to be placed under waiting orders, together with a written summons for each individual concerned.

When informed of the issuance of mobilization orders, district chiefs transmit to the town or village chiefs the written summonses received from regimental commanders, unless the men concerned are at the time called out for training or exercise, and these notices are served on individuals by the subordinate chiefs mentioned, who are required to obtain a receipt in each case. On receipt of a summons, or of information that it has been dispatched, the man concerned reports in person to the mobilization officer at the time and place specified in the summons.

Special provisions are made to insure as early a compliance with the summons as is practicable on the part of anyone

who is detained by sickness or who is temporarily absent from his domicile.

Men who, at the time of mobilization, are already out for training or exercise are released by the commander of the organization with which they are serving, and each is served with a new summons for service received from the commander of the regimental district.

In case an accident interrupts a reservist while en route to join, he is required to report-himself to the nearest corps, or if there be none within reach then to the nearest district, town, or village chief or police official.

SUPPLEMENTARY CALL

A supplementary call is for the purpose of filling vacancies that occur after mobilization has been completed. In this case, as in mobilization, divisional commanders send orders to the commanders of the regimental districts concerned, and also inform the local governors and commanders of the gendarmerie located in the same districts.

NATIONAL ARMY.

When it has been decided to call out part of the national army, divisional commanders^a give the necessary orders to commanders of regimental districts, noting particulars as to age, etc., of those who are to be called out and giving the name of the place where they are to assemble.

Town and village chiefs prepare and forward to district chiefs a numerical roll of members of the national army whose domiciles are registered within the limits of their respective jurisdictions.

On receipt of instructions, town and village chiefs give notice to the individuals concerned, and conduct them to their respective places of assembly at the designated time.

CALLING OUT FOR EXERCISE.

Calling out for exercise implies the calling out of officers and men at home for ordinary or extraordinary drills. As a

^a If the commander of the military division be absent in the field, then his representative, or successor in command of the military district at home.

rule men so called out join a unit belonging to the divisional command in which their domiciles are registered, but in the absence of such a unit, or sometimes because of special reasons, they are permitted to exercise with another unit.

CALLING OUT FOR TRAINING.

Calling out for training implies the calling out of the members of the conscript reserve in order to train them. To accomplish this, commanders of regimental districts prepare the necessary written notices of summons and forward them to district chiefs.

CALLING OUT FOR INSPECTION.

Calling out for inspection implies the mustering for inspection and roll call of noncommissioned officers and men in the yobi and kobi reserves, men on furlough, and in the conscript reserve.

FORMOSA.

Before the war the garrison in Formosa consisted of three brigades, quartered at Taihoku, Taichoo, and Tainu. These brigades were formed by detaching men from the battalions of each line division (except the Seventh) to the aggregate strength of one battalion, thus making eleven battalions, organized, as stated, into three brigades. Cavalry, artillery, and engineers were detached in a similar manner to the aggregate strength of three squadrons, eleven batteries, and three companies, respectively. It is believed the Formosa garrison numbered at the time stated about 15,000 men.

The war minister prescribed the special system to be followed in calling out for training, exercise, or inspection in Formosa.

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At Tiehling the stores intended for the different armies were placed separately, and each had its own *étape* headquarters, which prevented the congestion that would have accompanied a common supply office under the supervision of one head. Here again we observe desirable decentralization. The supplies coming in for the different armies were turned over by the railroad people to the proper *étape* officer, just as in our cities stores are turned over directly to the great wholesale merchants. In addition to the supplies brought from Japan, grain, in large quantities, bought in Manchuria, was stored here.

Tiehling is built in a low valley, a large part of which is subject to overflow from a little river that runs through the town. The site was a bad one for a large depot, and the Japanese were engaged in shifting supplies from one place to another, and in digging trenches and throwing up *enbank-*

ments to form a large inclosure from which the water could be excluded.

The Russian trenches and redoubts on the hills east of the Liao Valley were visited. Some of these were very strong, with good roads in rear to facilitate the transfer of troops from one position to another. In general, however, it may be said the position was too small for so large an army as Kuropatkin's, and it was weak in that the hills came to an abrupt termination about one mile east of the railroad, leaving a broad valley extending down to the Liao River, which could be commanded by hostile artillery from neighboring hills.

The Liao River was filled with Chinese sailboats carrying supplies to the Second and Third armies. It is believed the Russian cavalry might have caused the Japanese serious embarrassment by bold attacks on the river line of supplies. This cavalry was massed mainly with the Russian right wing, and by rapid movements might have passed around the Japanese left and created consternation among the Chinese boatmen.^a As it greatly exceeded in numbers the cavalry of Oyama's army, Mischenko, the Russian cavalry commander, might reasonably have counted on beating the mounted troops of his enemy, and by rapid marches to have evaded his infantry. During the summer the Russians did make some efforts against the Japanese line of communications, but the attempts were not serious. It is held by impartial eyewitnesses that in the one extended raid made by Mischenko, late in 1904, when he reached Newchwang, that he might have destroyed vast quantities of supplies there had he attacked in force immediately upon arrival, but that he delayed until the Japanese had reenforced their weak garrison by troops brought up by rail, when they were too strong to be beaten.

SECONDARY LINE OF COMMUNICATION.

The main line of communications by sea and railroad has been sufficiently referred to, but a proper understanding of

^a The country to the west of the Russian right—spring and summer, 1905—is almost a desert, and at seasons it is difficult for a mounted command to find sufficient water, but in summer the rains obviate this difficulty.

the manner in which the Japanese army was supplied requires that the "cart lines" be also described. To do this it will be sufficient to explain the system that existed in June, 1905, along the wagon road between Tiehling and Kuroki's headquarters at Chinchiatun, which village is about 35 miles to the northeast of the first-named place and in the mountains along the Shing River.

As a preliminary it should be stated that the roads in Manchuria are abominable. They wind through the mountains wherever there is a chance to get through. The bed of a creek furnishes a favorite location, if the water be not too deep or the bottom too soft. The natives make no effort to improve them. In the wet season the mud is bottomless, and in dry weather the rough and deep ruts almost make one wish for mud. At the time mentioned a few Japanese troops were engaged in grading and ditching the road leading to the First Army, but generally speaking the work was not important. Later in the season much excellent work was done along the Shing, but then the war was practically over, and the summer rains had ceased.

To have supplied the armies in Manchuria, under the conditions described, by wagons like those used in our Army, excellent as they are on suitable roads, would not have been possible. This statement is made with a full appreciation of the kind of roads found in some of the Southern States during our civil war. The wheeled transportation of the Japanese army plainly was not equal to the emergency. A liberal use of the carts owned by the natives alone overcame the difficulties, and it is not seen how they could otherwise have been successfully met.

As previously stated Tiehling was the railroad base at the front for the First Army. This army consisted of three divisions, the Second, Twelfth, and Guards (each with a regiment of cavalry and another of artillery), one kobi brigade (Umesawa's)^a, and at least three batteries armed with captured Russian field guns. As shown in the former pages, a division of the active army on the normal war footing has a grand total (combatants and noncombatants) of 19,322 officers and men. The strength of the kobi brigade, esti-

^a A kobi brigade was usually given the name of its commander.

mated in the same way, may be stated as 6,228, and of the three batteries armed with Russian guns as 698, making a grand total for the army of 64,892. An officer holding a high position in the staff stated about the middle of the summer that the First Army numbered at that time 100,000 men, but it is entirely permissible in war to give out reports of strength greater than actually exists, and this was probably done in this instance. It is not improbable that some of the organizations were above the prescribed strength, due to their commanders having made requisitions for men in anticipation for losses that did not occur, as has already been explained, and allowing what is believed to be a conservative estimate for these additional numbers we may give a grand total of 70,000 for Kuroki's army in June, 1905, a number that was quite generally accepted as correct by the military attachés on duty therewith.

As stated, the headquarters were 35 miles by wagon road to the northeast of Tiehling; the extreme right of the First Army was about 25 miles farther away, while the inner (left) flank was probably from 20 to 25 miles from the depot. These figures of strength and distances will give an idea of the task imposed on the secondary lines of communication and of the number of carts required.

The great bulk of the supplies forwarded from Tiehling was transported on Chinese carts. Here and there the Japanese "one-pony carts" assisted, but this was generally between some divisional storehouse and the nearest *étape* station, and was not important as compared with the work performed by the Chinese. When it is recalled that five armies, the independent cavalry and artillery, and perhaps some independent *kobi* organizations, had to be supplied in a like manner, the vital importance of this transportation to Marshal Oyama's army can be appreciated.

The Chinese cart is a clumsy thing, the axle turning with the wheel, and it only carries from 1,500 to 2,000 pounds, but it is strong, and that is essential in a Manchurian wagon. It is usually drawn by four ponies,^a or ponies, mules, and donkeys combined, while now and then an ox is substituted for a pony. In the wheel, between heavy shafts reaching about

^a See photograph, No. 15.



14. "ONE-PONY" CART, KAOLIANG FIELD IN BACKGROUND.



15. A CHINESE CART.

to the rear of the shoulders, is usually found a good, stoutly built pony. The three leaders pull abreast, attached by rope traces to various parts of the cart; they are seldom as good as the wheel pony. The harness is of rope, except the hames and collar. The latter is a canvas sack, stuffed with straw, the two ends tied together with a string above the pony's neck. Crude as these collars are they serve their purpose well, as a sore shoulder was seldom seen.

These carts were sent out in trains of a hundred or more. As the Russians never succeeded in harassing the line between Tiehling and the rear of the First Army, the trains were left pretty much to take care of themselves. A few Japanese train soldiers usually accompanied a cart column, exercising, however, only a general supervision over it. Between the depot at Tiehling and the divisional magazines located near the troops, there were intermediate *étape* stations, from 15 to 20 miles apart, a convenient day's travel for a pony team. At these stations there were small garrisons, and frequently large sheds covered with kaoliang stalks, to give shelter from the sun to passing troops during a temporary halt. At the depot a Japanese superintended the loading of the cart, made a memorandum of the contents, gave a little flag to the driver indicating the organization for which the stores were intended, and thought no more of the matter, not doubting the load would be delivered before night at the next *étape* station. On arriving at the latter place the driver easily discerned his allotted position in the transport park by observing the location of a large flag similar to the small one he carried. Here he at once unloaded the stores from his cart, for usually another carried them to the next station, while the first returned to the place from whence it came.

In the Chinese cart driver the Japanese had an ally who was of incalculable value. He was sober, industrious, and thoroughly reliable so far as concerned the delivery of his load. He provided his own shelter and food for himself and ponies. The Russians doubtless benefited in a like manner, but perhaps not to the same extent, for it is believed that such sympathies as the Manchurian possessed about the war were with the Japanese. It was reliably reported the latter were paying from \$8 to \$10 in silver (\$4 to \$5 gold)

per day per team and cart. Frequently there were two Chinamen with the cart, but this in no way affected its cost. This use of native transportation relieved the Japanese from much trouble and from the expense of purchasing and transporting to Manchuria by an already overtaxed railroad a large amount of public transportation, to say nothing of the difficulty of collecting in the field the additional forage that the public animals would have required. It likewise greatly decreased the number of transport soldiers who would otherwise have been needed, and in many ways lessened expense and labor. When a driver with his cart was no longer required he was discharged and summoned again when wanted.

When operating in a foreign country where there is abundant native transport its use for military purposes is well worthy of consideration, and in our earlier campaigns in the Philippines we profited to some extent by following this system.

The Manchurian pony team was undoubtedly poor and the cart primitive, but the important fact remains that they supplied immense armies with a minimum of trouble to the transport department and perhaps at a minimum of cost.

QUARTERS FOR FOREIGN OFFICERS.

Chinchiakou, the village in which the military attachés with the First Army were quartered during the late spring and the summer of 1905, is $3\frac{1}{2}$ miles from Chinchiatun, where Kuroki had his headquarters. The newspaper correspondents were located at Niachiakou, about midway between the other two places. This arrangement for quartering the attachés and correspondents was doubtless part of the general plan for guarding military secrets. That these were well kept there can be no question, but, as might be expected in carrying out such a policy, some subjects were at times enveloped in mystery that might have as well been imparted to both the attachés and correspondents. Generally the system worked well, but sometimes it approached the ridiculous.

At Chinchiakou on duty with the attachés were two officers of General Kuroki's staff and two interpreters, both of whom spoke English. Until the latter part of June the only

enlisted force present consisted of a few transport soldiers; later one battalion of the Thirtieth kobei was quartered in the village or in others within close proximity. Until this battalion arrived the village was in a disgustingly filthy and unsanitary condition. The attachés were quartered in houses, or rooms, from which the natives had been removed. In Manchurian villages the yards surrounding the houses are usually inclosed by high adobe or stone fences as a protection against robber bands. In these courtyards at Chinchiakou hogs, donkeys, ponies, and dogs roamed at will, and in fact they were stable yards of the worst kind. At this period a good climate was certainly our guardian angel, for there were swarms of flies to carry disease. This is not said in an unfriendly spirit, but merely as a statement of fact and as descriptive of the conditions as they existed. When the battalion arrived the Chinese were compelled to sweep the yards, the cattle were removed from the village, the streets were cleaned and ditched, and other measures taken that made life more endurable. Whenever Japanese troops remained for a few days in a village an attempt, more or less thorough, was made to clean it.

FIRST ARMY HEADQUARTERS.

General Kuroki received Captain Pershing and myself on the day following our arrival at Chinchiakou, when we were also presented to the principal staff officers. Kuroki is a soldierly-looking man, with an attractive personality. His face bears the stamp of decision, and, altogether, he is one who inspires confidence. Maj. Gen. Shigeta Fujii, who was the chief of staff, is an officer of high military attainments, and one who was habitually polite and cordial to the attachés with the First Army. Inquiry was made about the number of staff officers at headquarters and a list was given me containing twelve names, but I learned later that these twelve had assistants, and that the chief surgeon, chief of artillery, chief engineer, chief intendant, and other like officers were not considered members of the staff proper, although, of course, each stood in about the same position to the commanding general as the corresponding officer does in our service. Among those mentioned in the list, were

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On the day following our visit the chief of staff returned our call and gave us much interesting information about the general military situation.

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QUARTERING OF TROOPS AND ROLL CALLS.

It should not be forgotten that the Japanese army had practically no tentage other than the shelter (dog) tents carried by the men. The troops were quartered in Chinese villages, except a comparatively few at points along the railroad, who occupied old Russian barracks. This, of course, greatly reduced the amount of field transportation required and simplified the labor of moving the army. The villages in Manchuria are numerous, the country people habitually residing in them instead of occupying separate farm buildings, as in our country. Organizations were kept intact as far as possible, although the same company was sometimes scattered in different sections of a village. This caused less difficulty than might be expected, because of the excellent discipline existing and the disposition of all Japanese soldiers to strictly comply with orders. If the village was occupied for some days and the men of the company scattered as mentioned, the different squads usually had their own hours for rising, retiring, and for meals. No service calls were sounded in any part of the army. That the routine affairs of company and battalion life ran smoothly under these conditions speaks eloquently not only for the discipline of the privates, but also for the excellence of the noncommissioned officers, and indeed the squad leaders could be relied upon implicitly to have their men at a designated place at the hour prescribed. Roll calls were infrequent, and it is a fact, although not an agreeable one to admit, that the men did not have to be held in hand by their officers to the same extent that is necessary with American or European troops. It is believed, however, we can safely relax in some ways, at least as regards certain roll calls. There are those in the service now who can recall how certain officers predicted that dis-

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chief of staff, intelligence officer, assistant to intelligence officer, strategy officer, aids-de-camp, senior adjutant, assistant adjutant, signal officer, or, as he was called, officer in charge of telegraphs and telephones (lines of information). All these staff officers, except, perhaps, the aids, were under the direct supervision of the chief of staff, who exercised, it seemed, a rather rigid control. In a photograph taken of General Kuroki's staff by a correspondent at a previous period of the war, 47 officers are shown. This included all the staff proper and their assistants, and all officers attached in any way to the headquarters, as chief surgeon, chief engineer, etc., and also, it is believed, the officers temporarily attached for one reason and another, as the commander of the headquarters' guard and his assistants. General Fujii said one reason why the staff was good, was because it was small, but when we include all the officers who would properly constitute the staff of an army in our country, and who were actually present, we do not appear to suffer by comparison. Fujii said that a staff should be as small as is compatible with the work to be performed and every member thereof thoroughly drilled in his duties; that surplus officers are worse than useless because they often create work. In this statement he was undoubtedly correct, but the staff of the First Army does not appear to have been unusually small.

The limits assigned to the duties of the strategy officer were never definitely learned, but there is no doubt that important matters were intrusted to his care and that his imposing title of office was not an empty one.

An important distinction exists between the duties assigned to army headquarters^a in Japan and those that our system imposes on like headquarters. At the former the officers concern themselves mainly with collecting and digesting information relating to the theater of operations and the enemy; with the study of the strategy of the campaign, including the best lines for advance and the best means to secure the line of communications, and to maintain communication

^a These remarks are intended principally to apply to subordinate army headquarters like Kuroki's, Nogi's, etc., but were also true in a large measure about "grand headquarters."

between the principal subdivisions; with attack and defense; with the preparation and issuance of important orders, and kindred subjects. The routine administration, such as procuring supplies of all kinds and distributing them to the troops; the pay of the latter and the supervision of accounts and returns; the quartering of the men within the limits assigned for the division to operate; the necessary hospital arrangements, etc., are all under the control of the division commander and are directly supervised by members of his staff. The routine correspondence between division headquarters and Japan on the subjects enumerated, or between the same headquarters and the officer in charge of the advance *étape* station on the railroad, is carried on directly between division headquarters and the second party, without passing through army headquarters. Or it may be put this way: The system evolved in time of peace has provided a way for the division to take care of itself as regards all its essential needs, and the division commander is expected to do this without the assistance of higher headquarters, either the subordinate army headquarters or grand headquarters.

Thus it appears that the several army headquarters in Oyama's greater army, and Oyama's headquarters as well, were relieved of a vast amount of "paper work" that in our service would have demanded the constant and untiring attention, not only of the principal staff officers at the headquarters concerned, but also to a very appreciable degree of the general himself, to the grave detriment of the strategical and tactical considerations of the campaign. In this matter their system and ours furnish the two extreme examples of decentralization and centralization, respectively. That the former method is the correct one can not, it is thought, be seriously questioned. In the comparatively recent establishment of our geographical divisions we have taken a creditable step in the direction of decentralization, but as our geographical departments and divisions are distinctly a part of the peace, and not of the war establishment, no effort should be neglected to introduce this desirable departure from the old rut into any regulations that may be prepared in the future to govern the latter establishment.

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cipline was going to the dogs when the roll call at tattoo was discontinued, and yet there are few, if any, who would care to see it reestablished. Probably most line officers realize that they have attended many roll calls at retreat that served no useful purpose, and especially if in the mounted service, where the troop or battery has been formed a short time before to march to stables and again to march back to barracks. After witnessing what can be accomplished with a minimum of roll calls, I am of the opinion that any unnecessary restrictions placed on officers or men, especially if they be in the nature of keeping members of the garrison waiting around to answer useless roll calls, are not in the interest of discipline.

INFANTRY.

RECONNAISSANCE.

On the 24th of June, having obtained the necessary permission, Captain Pershing and I accompanied a detachment that had for its object the reconnoitering of the enemy's position beyond the Kao River, north of the Shing, the line of which, as formerly stated, was occupied by Kuroki's army. As this reconnaissance was skillfully conducted, well illustrating the study and care that the Japanese almost invariably gave to their movements in the field, and as every opportunity was given to us to observe the troops on the march, in bivouac, and in deployment for battle, it is believed a description of it will prove to be both interesting and of value.

The reconnaissance was under the general supervision of Lieutenant-General Nishijima, commander of the Second Division, whose headquarters were in the village of Shanmapu, in the valley of the Shing. On reporting at the said headquarters we were informed by Colonel Abe, chief of staff, that we would accompany him and march with two battalions of the Thirtieth Infantry, active army (*jōbi*). Lieutenant-Colonel Kawasaki commanding, and that the reconnaissance had the double purpose of observing the enemy and of enabling a map to be made of a section of the country beyond the Kao, as little was known of the terrain there. The Russians were reported to have outposts along the Kao River and 6,000 men at Koulatzu, a short distance

north of the Kao, and 1,000 more about 5 miles due west. The Twenty-ninth Infantry was ordered to reconnoiter on the left (west) of the Thirtieth, and a battalion of infantry with a battery was to move on the right of the latter, and to take position on a high hill overlooking the valley of the Kao to cover the right flank of the Thirtieth while it was reconnoitering north of the river, as it was feared the enemy at Koulatzu, higher up the stream than the point selected for crossing, might attack.

In company with Colonel Abe we started to overtake the Thirtieth Infantry already in march, and crossing the divide between the Shing and Kou rivers we passed outside of the Japanese outposts, proceeded about 2 miles parallel to their front and then passed back again and joined Lieutenant-Colonel Kawasaki, who had halted for the night at a small village in which most of the troops were quartered, while the others were in camp under shelter tents. All were preparing their evening meal. The shelter tents were rectangular pieces of khaki canvas with brass eyelet holes around the edges. They were not put up as is the custom with us, but several were tied together to form the top, and others the back of what we may term a shed, sufficiently large to afford shelter for a squad. The rifles were stacked in front of the tents, and long grass had been cut and laid down as a bed. A line was marked out where the men were to retire to attend to the calls of nature, but no sinks were dug.

The village was so disgustingly filthy and unsanitary that it was a surprise to find troops placed therein. The commanding officer took quarters there with his men, and Captain Pershing and I were assigned to a house near headquarters. Much has been said, and justly, about the wise regulations governing sanitation in the Japanese army, but it is beyond question that soldiers were at times unnecessarily placed among as unsanitary surroundings as can well be imagined—in places where an American officer would not think of quartering his men. Why all were not put under shelter tents on this occasion was not explained. Apparently, however, as many were squeezed into the village as it would hold. There had been recent rains, and as one stepped from the houses into the surrounding yards, where there were numbers of loose hogs, donkeys, and ponies, he found the mud and

manure ankle deep. Although it was 7.30 p. m., there was good daylight and myriads of flies covered everything. Fortunately for the Japanese they cooked their food in individual mess cans, and it was little exposed to flies.

After having noted the unsanitary surroundings it is a pleasure to turn to some of the effective measures taken to insure health. As a precaution against impure water, the latter was being boiled in a hot-water cart.^a This cart is drawn by one pony, as is another having two tanks, each similar in shape to an artillery limber chest of the old pattern, into which the boiled water is emptied and allowed to cool. There were also two heavy canvas sacks, each kept open at the top by a circular hoop. They grew smaller toward the bottom near which a filter was fitted. Water was poured from a nearby well into the sacks, and drawn by the soldiers through the filter into their water bottles.

The command was remarkably quiet and orderly as each man moved about preparing his meal of rice, and although all soldiers are wont to be serious and steady on the eve of anticipated battle, I thought the bearing of these Japanese conveyed more—the idea of a dogged determination that boded ill for their enemy.

The colonel explained the particular disposition he had made of the troops by saying he had placed a strong force in front of his headquarters to meet a possible attack by the Russians, and added that the command would be awakened at 3 o'clock and that we would march at 4. In the morning the men were quietly awakened by voice and immediately commenced their preparations for the march. A drizzling rain was falling, with every indication that it would last all day. The battalions were formed quietly and moved off in a business-like manner at the appointed hour. In anticipation of a rapid march, the shelter tents were left standing and the knapsacks left in the village, as it was fully intended to withdraw as soon as the information sought was secured. The infantry marched in columns of twos and the mounted officers and their orderlies in column of files. These columns, respectively, were largely used in Manchuria for at

^a Photograph No. 16.

marching on the hypotenuse of a right-angle triangle, reached its position considerably in advance of the battalion which marched along the two sides.

After the leading battalion had advanced 800 yards the second moved forward and to the left of the first. As the two battalions left the river to explore the hills on the north (right) bank, two companies were posted near the crossing to cover the rear and to keep open the line of retreat. Although the Russians had placed intrenchments to command the ford they were not occupied.

The Japanese, having accomplished their survey by noon, retired. Many of the young Japanese officers had, by this period of the war, learned to map-make with marvelous rapidity, and on this occasion they did creditable work.

The battalion and battery sent to the right had forced a considerable detachment of Russians to retire, who might otherwise have seriously annoyed the reconnoitering battalions.

As stated the tactical dispositions made for this reconnaissance are considered skillful; the two reconnoitering battalions were covered on the east (right) by a battalion and battery that forced the Russians to withdraw from a position in that direction, from which they seriously threatened the right flank of the advancing battalions, while the latter were covered on the west by the Twenty-ninth Regiment, in front of which considerable firing was heard early in the day. We also see that minor precautions were taken to conceal the command as long as possible, to prevent ambush, and to secure the line of retreat. It was evident that the entire movement had been carefully thought out and ordered, and also that the officers had been trained to seize promptly every advantage offered by the terrain.

It had been intended to pass the night at the village occupied the night before, but by the time the return march was commenced the rain was falling heavily, and as the village offered poor shelter, the commanding officer decided to push on 8 miles farther to the permanent quarters of the troops, which were reached at 10 p. m., after marching about 25 miles since 4 in the morning. It is true that most of the march was made without knapsacks, but when we remember

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least small and moderate-sized columns of foot and mounted troops, and resulted from the fact that the only roads there consisted of the tracks made by the Chinese cart and its ponies, along which a wider column could not march to advantage.

The head of the column was covered by a few cavalry scouts and each battalion was followed by packed ponies loaded with machine guns, hand litters, ammunition, and large intrenching tools, the latter being, in addition to the smaller ones, carried by the men. The hot and cold water carts were also in the column.

The manner in which the battalion commanders conducted the march did not produce a favorable impression. There were frequent halts, due doubtless to the examination of the country by the advance guard. After these pauses the head of the column would be put in march with a quickstep without warning to the men in rear, who, in consequence, would not move until they observed those in their immediate front advancing, and this, and the failure to decrease temporarily the rapidity of the step after passing an obstacle, or while descending from the summit to the foot of a hill where the length of the step is naturally long, caused much opening out and made it necessary for the men in the rear to frequently take the double time in order to maintain their proper position, thus unnecessarily taxing their strength at a moment when it should have been carefully husbanded, and this too when the drizzling rain made the footing slippery and difficult.

The average strength of the companies was 175, giving to the two battalions a total of 1,400 actually in ranks. This does not include the men with the packs or with the machine guns. It was understood that at this time the companies of infantry throughout the army were 250 strong. It is probable that the marching strength of the companies of the Thirtieth Regiment was reduced by men being left in charge of quarters and on the established outpost line.

The road selected followed a little stream to the valley of the Kao, from which it was hidden, however, until near the river, by the hills lying between the tributary we followed



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and the next one to the left, thus concealing the column from the Russian outposts along the Kao. A short distance before reaching the main valley a road branched off through a little canyon to the left and led to the next small valley below. Here was an opportunity to conceal the command while the cavalry scouts were exploring along the Kao and until deployment was decided upon. The commanding officer promptly took advantage of the terrain and marched the column into the canyon, where he quickly made his arrangements to debouch from the next small valley to the left into the main one along the Kao. This handling of the command was skillful in the highest degree and it was a pleasure to witness it.

While halting here a litter-bearer company, 100 strong, joined the column. They were fine-looking men and unusually large for the Japanese. Their appearance looked businesslike and seemed to preclude any necessity arising later to fall-out many men from the line companies to take the wounded to the rear, a practice that can very quickly deplete a firing line. Later, when the deployment of the first battalion was complete, the litter bearers pushed forward and in a remarkably short time displayed the Red Cross flag from a village near the river.

Captain Pershing and I, following the chief of staff, rode to the head of the column. A staff officer present said so far as he knew no other attaché had been permitted during the war to witness the deployment of the infantry into battle formation. Fire was soon opened by the Russians on the Japanese scouts, and the leading battalion moved rapidly forward and debouched from the hills into the valley of the Kao, while the second was held temporarily in reserve. The first battalion originally deployed one company in extended order, the other three following in line of columns of fours with close intervals at 100 yards distance, and rapidly followed the retiring Russians across the Kao. As the battalion intended to turn to the right after crossing the river and march east through the hills along the right bank, a half company was detached before reaching the stream to cross into the hills to the right front to reconnoiter, and to prevent the head of the column from falling into ambush. This company.

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that the rain was discouraging, the roads heavy, and the latter part of the journey made in the dark it will be seen that the march was a good test of endurance and one in which the troops showed to advantage.

Captain Pershing and I were requested to ride on to division headquarters, 6 miles from where the command halted, and did so. On taking our leave next morning, Lieutenant-General Nishijima said he was sorry we had been exposed to such inclement weather, and trusted we had derived some satisfaction from the march in spite of the rain, adding that he hoped to see us again and that he would take pleasure in giving us all the information in his power. I wish to emphasize this conversation in view of the reported experiences had by attachés on other occasions, and to call attention to the fact that on the march mentioned we were allowed to mix with the troops about as freely as were their own officers.

MACHINE GUNS.

In connection with this subject attention is called to a foregoing statement that the Thirtieth Infantry was followed on the march by its machine guns. These guns were highly thought of in the Japanese army and the propriety of attaching them to the infantry was never heard questioned. Four or six guns per battery and one battery per regiment ^a were usually suggested, although good arguments have been heard for eight guns in a battery, and the wish for twelve was sometimes expressed.

An opportunity was given to me on one occasion to closely observe one of these batteries; it had four guns, made on the Hotchkiss pattern. Three pack ponies were assigned to each gun detachment. The first pony carried the gun, tripod, and shield, the gun on the right, the tripod on the left, and the shield on the top of the pack; the two former being incased in canvas. The second pony carried an ammunition box on either side, 900 rounds per box, and a similar box on top to hold tools and the spare parts of the gun, while the third carried a long ammunition box on either side, 1,200 rounds per box.^b Thus there were 4,200 rounds per gun.

^a These regiments were about 3,000 strong.

^b See photographs Nos. 17, 18, 19, 20.



17. MACHINE GUN—AIMING.



18. LOAD SHOWING MACHINE GUN AND SHIELD.



19. PACK PONY, MACHINE-GUN BATTERY.

The gun detachment consisted of five men, two of whom remained with the gun while in action, one to fire and the other to feed, while the remaining three laid down 10 yards to the rear. Each pack pony was led by a soldier. The battery maneuvered well, but of course slowly. When formed in line—guns packed—there were three lines, with intervals of 10 yards and distances of 5. On coming "in battery" the ponies were conducted to such cover as was available as soon as the guns were unpacked. It took about three minutes to unpack and set up the guns. The caliber is .256 and the gun fires the same ammunition as the infantry rifle.

On the outbreak of the war the Japanese expected to largely limit the use of the machine gun to the defensive, but experience soon taught them to widen its field, and later it was used to great advantage on the offensive.^a Their rapid fire frequently silenced the fire of the Russian infantry, and caused the latter to crouch down in their trenches. When the guns stopped firing the Russians could be seen again popping their heads above the parapet. If the flanks of a line be weak, these weapons can be used there advantageously.

Six guns were generally recommended for a battery, thus permitting of an assignment of two per battalion. One officer of high rank, however, who was heard to discuss this question ably, said he preferred eight guns, and that he would divide these into two equal sections and assign each section to a battalion, thus leaving the third battalion without any. His idea was to use these guns both on the offensive and defensive. On the offensive he would send them forward among the first lines of the battalion to which attached, or reinforce these lines by the guns at an early stage of the action. In this way he would use them as a substitute for infantry reinforcements. This system will enable the regimental commander to hold the third battalion much longer intact for a decisive effort when an opportunity offers.

^a In our service the efficiency of this gun on the offensive was well illustrated at Santiago de Cuba.

Officers who had had experience with machine guns were opposed to using them singly, saying never less than two should be at any position; this not only to obtain volume of fire, but also because a gun can so easily be put out of action. In order to reduce the losses among the men from shrapnel fire to a minimum, they recommend the guns in a platoon be separated by 20 meters and the platoons by from 100 to 200 meters. Artillery fire is looked upon as the most dangerous foe of the machine gun, and in fact the most effective use of the latter on the offensive presupposes the enemy's artillery has been silenced, or at least that its attention is well occupied by friendly batteries.

The machine gun is believed to be especially useful in mountainous districts, where the elevated ground often discloses the close formations of the enemy. The Japanese frequently fired it from an elevated position over the heads of their infantry, and in this way, as their battalions advanced, they at times kept down the fire from the Russian trenches. An officer who commanded one of these batteries at the battle of Mukden, and who later was detailed to lecture to the attachés with the First Army, said that on one occasion there he continued this fire until their advancing infantry had arrived within 30 meters of the enemy's position. It is claimed the fire should almost invariably be directed against the opposing infantry. The gun is comparatively heavy, and when in action the battery is advancing with the infantry it is sometimes difficult to keep up with the latter, and moreover the men carrying the gun offer a good target, and for these reasons the guns should frequently remain in position as the echelons make their rushes, provided cover is had and a free field of fire secured. It is not essential that they be at all times immediately on the line occupied by the infantry, although when the latter, after a considerable advance, meets with determined opposition, some guns should be brought up. This will give a feeling of confidence, and if need be, help to check a counter attack. When advancing under fire, it is often a good plan to move one gun at a time. Battery commanders reported good results when firing at long ranges—that is, between 1,200 and 1,800 meters. One thousand five hundred shots per gun is the greatest number I

heard of being fired in one hour. These guns were sometimes attached to outposts.

The loss among men serving machine guns is usually great, and this requires that a large number be trained in each regiment to use them. One officer of experience with these weapons thought all officers and men selected to work with them should be trained at division headquarters or at some other central point in order to secure uniformity of instruction and service.

On a previous occasion I reported that the shield was not generally desired. I wish to modify that statement, as further investigation showed that while different views were entertained on this subject the consensus of opinion was favorable to the retention of the shield. The objections to it are that it offers a good target and is more or less difficult to handle on the offensive. Some officers were in favor of using it on the defensive but not on the offensive. In general, however, it was thought that both on the defensive and offensive it gives material cover and adds confidence and composure.

The guns were almost invariably transported on pack ponies, except, of course, when effecting changes of position under heavy fire, when they were carried by hand. It is understood wheels were occasionally used in some parts of the army, but I never saw the gun transported that way.

Good as the machine gun is, and not overlooking the advantage of being able to renew its ammunition supply from the infantry transport or line, it is undoubtedly inferior in some important particulars to the 1-pounder automatic gun (pompom)^a which, with its greater range, also serves as a better range finder for the infantry.

BAYONET.

There is but one opinion in the Japanese army about the bayonet, and that is that it should be retained, made on the best pattern, and the soldiers thoroughly trained in its use. It is doubtful if any accurate information can be obtained about the casualties caused by this weapon during the war.

^a No pompoms were seen with the Japanese.

It is unsafe to draw conclusions from the relatively small number of such wounds found in the hospitals, for it was generally believed that those who received a bayonet thrust died on the field and therefore never reached a hospital. The war demonstrated that even if bayonets are not crossed the moral effect produced by them must be frequently brought into play to cause the enemy to desert his trenches. Herein theory and practice do not agree, for it has been held in theory he would be driven out by rifle fire. In night attacks the bayonet is essential. It should be sword-shaped and kept sharp. The Russians had the old-style bayonet with blunt edge. The active Japanese caught hold of these and pulled them off or pushed them aside.

NIGHT ATTACKS.

The Russo-Japanese war gave a new stimulus to night attacks. High Japanese officials said that such attacks, made on a moonlight or even a starlight night, were not as difficult as generally believed, but they did not recommend making them on a dark night. These attacks should be preceded by most painstaking reconnaissances, and the organizations selected for the work should be fully informed of all the details of the intended assault and thoroughly instructed as to their line of direction and objective. In the preliminary reconnaissances, it is important that other positions be examined and even attacked in order to mislead the enemy as to the selected point. The Japanese claim that they frequently knew where to meet the Russian assault, as the enemy usually confined his reconnaissance to the vicinity of the position to be attacked. In the language of a Japanese general "it is a great advantage to surprise the enemy. To do this it is necessary to capture his sentinels. This the Japanese accomplished on occasions by quietly surrounding them, when it was found they would seldom fire, and the attacking line has sometimes approached as near as 30 paces to the Russian position before being discovered."

The supporting lines should be kept close, "as close as possible," to the first. The following formations were generally accepted as correct for the three echelons: First echelon, in line in close order; second, in line of companies in

column of sections (platoons); third, in line of masses. The first line should be ordered to fire only in case of great emergency; the other lines not to fire under any circumstances. All should have bayonets fixed. To prevent the echelons from becoming separated, soldiers with small white flags, or in white clothes, should be placed between them, and distinctive marks, as white bands, should be worn uniformly by all the men to enable them to distinguish friend from foe. The first echelon should be preceded by scouts, instructed to lie down if fired upon so as to permit the echelon to open fire if that becomes necessary.

If the advance be for a considerable distance, the echelons may first move in line of companies in column of fours.

Each officer should carry a compass, and in the preliminary work officers' patrols are important.

While the losses among enlisted men in night attacks fell below the expectations of the Japanese, that among the officers who led was heavy. In these attacks it is important that the officers lead their men.

DRILL REGULATIONS.

While the First Army was lying in position along the Shing River, the companies and battalions were frequently turned out for drill. Thus an opportunity was given to gain a fair idea of the Japanese drill regulations. The company is divided into three sections, each commanded by a lieutenant. When in line, the section commanders are in the front rank in the intervals between the sections. The company has four trumpeters. Column of fours is formed from line (double rank) by facing in the desired direction and doubling up, as was prescribed in the Casey tactics formerly used in our service. Lines of skirmishers may be formed both from line and from column, to the front and to the flanks. Line of squads may also be formed and later deployed in line of skirmishers to the front and to the flanks. The squad consists of eight files. In taking extended order the men on the flanks move at the full run. This was observed not only in Manchuria, but in the training of the conscripts in the depots in Japan. Likewise an echelon sent forward to reinforce another moves at the full run. In first deploying as skirmishers the captain usually holds

one section in reserve. On lying down on the skirmish line all take the prone position except the captain, who kneels. In the charge the officers lead, waving their swords. The men may lie down in column of fours. In the parade step, frequently called the "goose step," the soldier raises the knee high, and gives an exaggerated swing to the left arm. All troops seen at drill appeared to be well instructed and performed the movements ordered with precision. The only criticism that can perhaps be fairly made, is that the officers did too much loud talking and shouted unnecessarily in giving their commands. After each drill the battalion commander assembled the officers and gave his criticisms, and any lack of promptness in the execution of a movement was sure to be commented upon. Firing in line in close order, both standing and kneeling, was frequently practiced at drill, although probably no troops ever took greater advantage of cover in action than did the Japanese on suitable occasions.

TARGET PRACTICE.

Whenever the conditions permitted, the troops in the field were instructed twice monthly in target practice. On several occasions I participated in this practice at 300 and 500 meters. The target for these distances is 1.65 meters high by 1.30 broad. Around the center of the target are 10 circles, 5 centimeters apart. The circles are numbered from 1 to 10, and the hits are scored accordingly. Any hit on the target outside of the largest circle is counted as a miss, just as if the target had not been struck. Individual practice at known distances is given to all men up to 600 meters. Expert shots, it is believed, are permitted to fire at greater distances. I was told that volley firing and firing on the skirmish line extended to 1,300 meters. It was said that instruction to include 300 meters was usually given standing, but in all the practice observed at this distance the men took the prone position, except in one instance, where the man knelt. The soldiers approached the firing position in squads and halted a few yards in rear. A noncommissioned officer then invariably inspected the rifles, to see that they were clean and in proper condition for firing. I was much impressed by the good care the Japanese infantryman gave to his rifle, and I

never saw a dirty one. In commenting on this to an officer, he said that in former times the Japanese warrior looked upon his sword as part of his spirit, and that now they tried to impress the soldier with the same idea about his rifle, in which they seem to have succeeded admirably. The shooting observed was generally good. The soldier usually attended target practice wearing his waist belt, with the bayonet and the prescribed three cartridge boxes attached. He also carried the knapsack, but it is believed it is not usual to carry the blanket, overcoat, meat can, and extra shoes.

LINE OF ATTACK.

The first echelon thrown out in extended order should possess sufficient strength to drive in the enemy's advance posts without delay. Losses met by the assailants at this period of the action are without any compensating gain and are demoralizing. The attackers feel they are taking punishment without enjoying an opportunity to hit back.^a As the action grows supporting lines follow in such formations as may be suggested by the cover at hand, and while the latter may cause the distances to vary to a certain extent, it should always be remembered that these lines are for the purpose of reenforcing those in front, and it is essential that they be held sufficiently near to do this at the right moment and in an efficient manner. This can not be done if the distance to be covered in the rapid advance is so great as to cause excessive fatigue, and more especially if the line in its long advance offers a continuing target that entails a heavy loss from the enemy's fire. These remarks are applicable both to the echelons following early after the firing line and to the heavier reserves in rear.

It is conceded that as the war progressed the Japanese made a considerable change in their extended-order formations and attacked in much wider and looser ones than in

^aAt Santiago de Cuba the First Division and the cavalry division, while advancing on the morning of July 1 from El Poso to San Juan, although necessarily in column because of the narrow road and dense undergrowth, underwent this experience. Men were being killed and wounded by shots coming down the road without an opportunity to fire back, and this was creating demoralization. The divisions were ordered to push on more rapidly and put the men into position to fight.

the earlier battles fought, and to this extent at least broke away from their German teaching. Their infantry largely used individual fire, with volleys at long distances. With the Russians volley firing was quite common, and was fair, while their individual firing was said to be generally poor.

It is important that the powder used in the small arms be really smokeless, for the slightest color serves to betray the position of a line.

In the Japanese infantry the supply of ammunition was kept up by transporting it on pack ponies to the nearest cover and sending it forward from there by men specially detailed for the purpose, who carried it in any kind of cloth slung over the shoulder, but usually in the blue canvas bag that has been previously mentioned. Reenforcing echelons also brought up, when necessary, a new supply for the men on the firing line.

INTRENCHING TOOLS.

When we recall that the modern system of hasty intrenchments had its birth in our civil war, it would seem that no remarks on this subject were necessary, but unfortunately we were behind others in adopting an intrenching tool and are following where formerly we led. The pick and the spade will play an important rôle on the battlefield of the future, and it is well that we have finally decided to add them to the soldier's equipment. I was favorably impressed by the Japanese method; namely, small tools carried by 50 per cent of the infantry and larger ones transported on pack ponies that marched with the battalion. I would go a step in advance of the Japanese, however, and give intrenching tools to our cavalry.

EFFECT OF ARTILLERY FIRE.

Although infantry acting on the offensive may meet with considerable losses from artillery fire, the attacking lines should not ordinarily be driven back by this fire alone or even permanently checked by it. The target offered is too temporary and frequently during the rushes too uncertain for the artillery to gain a decided advantage. The reasons for this were several times pointed out to me while with the Japanese army and may be briefly stated as follows:

We may assume that if the army be in fit condition to send

its infantry forward to the assault, its artillery is in condition to at least demand serious attention from the batteries of the enemy, and that when the assault begins an artillery duel is on unless the enemy's guns have been already silenced. The firing line, which has previously been concealed, followed by the supporting lines in formations dictated by the terrain, advances by rushes. These are short and are quickly made. Before the artillery of the defense can turn its attention from the duel in which it is engaged and get the range of the target offered by the advancing infantry the rush is over, and the target disappears as the infantry lies down. Then the guns of the defense are again hastily turned upon those of the attackers, whose punishment they have been taking in the meantime without reply. Another rush follows on the part of the infantry with similar results, and then another and so on. My attention was particularly called, by a foreign attaché, who, by the way, was an artilleryman, to one instance where three batteries were firing at a range of 3,000 meters at infantry advancing in several lines, the first one well aligned and the others broken into groups. Two of the batteries were using indirect and the third direct fire. The infantry went right on, with considerable loss, it is true, but not enough to stop it. This does not imply that artillery does not play a great rôle, but it is thought that, contrary to the general belief, the guns of the assailants will frequently perform a more important part than those of the defense. The intrenchments of the defenders usually offer a good, as well as a permanent, target, and it is the part of the attacking artillery to shake to the utmost the morale of the opposing infantry, thus preparing the way for the final assault of the friendly infantry. This is frequently done to better advantage by silencing, or at least seriously crippling, the guns of the enemy in the preceding artillery duel. In connection with the artillery fire, and in order to lessen the murderous effect of the magazine fire of the defense when the assaulting infantry is closing upon its enemy, the machine guns of the assailants should continue to play on the enemy's intrenchments to the last moment. It will be recalled that the fire of these guns frequently caused the Russian infantry to crouch down in their trenches and suspend their fire. It will also be remembered

that the captain of one machine-gun battery said he continued to fire on the enemy on one occasion until his advancing infantry had arrived at 30 meters from the Russians.

The carrying of battalion and regimental flags by the assaulting infantry has both advantage and disadvantage; they assist the friendly artillery to determine when to stop firing in order not to hit the advancing lines, but they also betray the positions of the latter to the hostile gunners. When in addition to the benefit mentioned we consider the enthusiasm that often accompanies a display of the colors, it is believed their presence is desirable.

OUTPOSTS.

Shortly before the official announcement was made of the cessation of hostilities, permission was given me to visit the Umesawa Brigade, holding the extreme right front of Kuroki's army. To this brigade were attached the Guards cavalry, 1 regiment, and 3 batteries of field guns, captured from the Russians. It will be remembered the statement has been made that the Japanese army had no tents and that the troops were quartered in Chinese villages. These villages were, of course, frequently at a considerable distance from the line selected for resistance in the event of an attack by the Russians, and this necessitated a disposition of the troops that was often quite different from what would have been made had the army been sheltered under canvas, with the organizations placed immediately in rear of the positions assigned them on the defensive line. As the conditions that existed in Manchuria in this respect are wholly novel to our service, a description of how the Umesawa Brigade and the troops attached thereto were posted may be of interest. The brigade commander had his headquarters in the village of Ihashako,^a about 22 miles by wagon road to the southeast of Kuroki's, on a considerable stream flowing to the southwest, perhaps the headwaters of the Hun. The advance troops of this brigade, consisting of the Guards cavalry, two battalions of infantry, and one battery, were posted in the village of Rikadai^b on a tributary of the Shing River, and

^a About where Liakotal is shown on the Strategical map of part of Korea and Manchuria.

^b About where northern Takuchiatzu is shown on Strategical map.

about 8 miles, a little east of north, from Hashako. Between the two villages there is a semicircle of high hills with the ends of the arc resting on the tributary of the Shing River, and the rear of the semicircumference extending well back toward Hashako. The infantry of the Umesawa Brigade was encamped well to the rear of this semicircle in the village of Hashako, and others near by. Strong intrenchments had been made along the summit of the hills, which I estimated to be about 8 miles in length. Between these intrenchments and the river flowing by Rikadai were a number of other prepared positions, where, in case of attack by the Russians, the infantry, cavalry, and artillery at Rikadai were expected to make successive stands in order to detain the enemy long enough to permit the infantry of the Umesawa Brigade to form on the hills crowned, as stated, with intrenchments. All of the latter were well made and skillfully laid out. In advance of Rikadai infantry outposts were thrown out about $2\frac{1}{2}$ miles. It was understood a battalion^a was assigned daily to this duty. The support of one picket was posted in a village near which a strong earthwork for both infantry and artillery had been erected. This earthwork commanded a road leading into the foothills across the river to a Russian position about 5 or 6 miles distant. The pickets were from 500 to 800 yards in advance of the support, and they and the sentinels were usually found under scattering trees in the valley or in the edges of kaoliang fields. One detachment was posted on a high hill commanding a fine view of the surrounding country. The cavalry of the Guards did not perform picket duty, but was used in reconnoitering, and a few men acted as messengers between the outposts and the village of Rikadai. Every precaution seems to have been taken to make an early discovery of any advance from the front on the part of the Russians, and to put up a good fight if necessary to give the brigade of infantry time to form. The right seemed to be "in the air," especially as the statement was made that 5,000 Russians occupied a position about 15 or 20 miles up the river (to the right) and somewhat to the rear. In reply to an inquiry the commanding officer said that the next troops on the right

^a The normal strength of the battalion is about 1,000.

were "a long way off, but that steps had been taken to protect the interval." Without speaking positively on the subject, I am of the opinion from information received later that Kuroki's right was covered by the Fifth Army, somewhat refused.

CAVALRY.

The organization, armament, and equipment of the cavalry has already been described, but some details connected with this arm have yet to be mentioned, as well as some remarks made upon the manner in which it was handled in the field.

HORSEMASTERSHIP.

The Japanese display great patience in training the horse. In his education, however, they proceed like men who are following written instructions rather than experience. While breaking an animal they frequently give him a handful of food to increase his confidence, and when he fights against taking the bit he will usually be encouraged by having some grass or hay laid on it.

In the simple matter of providing shelter for the animals whenever it was practicable to secure it the Japanese are entitled to praise. The stables in the fields were frequently mere sheds with kaoliang stalks used for cover. They offered but little protection against rain but answered to keep off the sun during the hot summers. We can undoubtedly profit by this example. In the field our horses while in camp are habitually tied to a picket line where they are exposed to all kinds of weather without any attempt being made to cover them. It is as easy to improvise sheds in this country as in Manchuria. A few poles and some cornstalks or straw would suffice. In the post our animals are frequently treated in an inconsiderate way, by being turned into the stable yards to swelter under the glare of a midsummer sun, and this treatment undoubtedly accounts for a great many of the sore backs found in our service. When we recall the unprecedented loss of cavalry horses in our civil war, we realize that these simple and humane precautions in the care of the horse may go far toward the saving of millions of dollars. Great cleanliness was observed about the Japanese stables, and whenever the ground in a stall became wet a thin layer of sand was thrown over it.

While there is not much that can be said in praise of the Japanese cavalrymen as riders, they usually cared for and groomed their horses well. It did not seem necessary to prescribe an exact hour to have all the men at the stables for grooming. They came and went about the same time, each taking care of his horse as if the latter was his own property. There was an individuality about their work that impressed me favorably. Their saddles, bridles, blankets, etc., were invariably kept in good order, and when not in use were neatly arranged, hanging against the wall or placed on racks in improvised saddle rooms.

VETERINARY SURGEON.

The veterinarian is a man of considerable importance in the Japanese army, and one who carefully looks after the animals placed under his charge. The manner in which he is selected has been stated.

HORSESHOES.

Nine sizes of horseshoes are furnished; those for the cavalry are all light and well made. I saw none of the heavy and undesirable shoes that have sometimes been forced on our cavalry against the wishes of the officers thereof. A peculiarity of the Japanese horseshoe is that it has 16 nail holes—8 on either side, although but 4 nails are driven on each side when the horse is shod. It is claimed this permits a desirable place to be selected to drive the nail if the hoof be partly broken, or to drive an additional nail if the shoe becomes loose. Undoubtedly the shoes held well, and a horse with a bare foot or a loose shoe was an uncommon sight. Many of the nails used were made in Japan; some were imported from England and some from America. The Japanese and English nails were usually smaller than the American, but I was told they held the shoe fully as well.

In shoeing the horse two men take part, one holding the foot while the other drives the nails. A low wooden foot rest upon which to place the hoof is also used. The knife is used in trimming the hoof, but not to excess.

SADDLE.

The Japanese saddle is inferior in many ways to the one used in our service, but it certainly holds its place better

and requires less readjusting on the horse. The officer's saddle is built on the model used in England by civilians; it has the necessary arrangements at the pommel and cantle to attach pockets at the former and to fasten the overcoat at the later. As already stated, the saddle used by the cavalry soldier stands high above the horse's back and does not afford a very secure seat. It does, however, hold its place well. For many years I have been of the opinion that the bottom of our cavalry saddle—that is, the bearing surface—is too short and has too great a curve, giving the saddle a tendency to rock that causes the blanket to work back. All cavalrymen in our service are familiar with the command, "adjust your saddles" at almost every halt. The Japanese saddle if carefully placed in the morning needs little further attention during the rest of the day. In their saddle—or rather in the pad fitted to the underside thereof—the length of line along the upper edge, the part that is next to the backbone of the horse when the saddle is placed on his back, is 23 inches, while the longest line in the bearing surface of our saddle, which is about midway between the upper and lower edges, is 20 inches on a saddle with a 12-inch seat. The length measured along the bottom of the Japanese pad is 24 inches. The depth along the front edge is 9 inches; midway between the front and rear of the pad $6\frac{1}{2}$ inches, while at the rear it tapers to 1 inch. In the McClellan tree the depth of the bearing surface along the front edge is $5\frac{1}{2}$ inches, midway between the front and rear $4\frac{1}{2}$ inches, while at the back, the deepest part, it is $6\frac{1}{2}$ inches.* Though advantages may be claimed for our saddle, and there are many, the unnecessary rocking motion, due to an insufficient and imperfect bearing surface, is undoubtedly the direct cause of making many sore backs. Our saddle could also be improved and rendered less liable to slip on the blanket if we covered the bottom with sheepskin with the wool left on, or something of that nature. Our stirrup is immeasurably superior to theirs, but it is believed that the one furnished for our enlisted men can be improved by leaving the hood off, covering the wooden stirrup with leather, and raising the tread slightly toward the toe. The hood frequently

* See photographs Nos. 21 and 22.



20. MACHINE-GUN BATTERY; PACK PONIES AND DETACHMENTS.



21. JAPANESE AND AMERICAN CAVALRY SADDLES, SHOWING GREATER BEARING SURFACE OF FORMER.

becomes bent and prevents the trooper from forcing his foot into the stirrup as far as the heel, which if practiced occasionally on a long march will give rest.

BRIDLE.

For many years I have believed in the double rein for cavalry, and my experience in Manchuria only served to confirm me in this belief.

FORAGE.

The forage as fed at the horse depots in Japan differed somewhat from that furnished in the field. At the former the daily allowance was as follows:

Hay	pounds..	8. 2817
Straw of oats with the oats left on.....	do.....	4. 1408
Oats	quarts..	4. 764
Barley	do.....	1. 588

Thus we have hay and straw combined (less the weight of the grain on the latter) 12.4225 pounds, and grain, besides the oats on the straw, 6.352 quarts.

At the depots the horses were fed grain at 6 a. m., 12 m., 4 p. m., and 8 p. m.; hay at 10 a. m., 12 m., 4 p. m., and 8 p. m., the largest quantity being given at the latter hour. The animals were in fine condition.

During a visit to a regiment of cavalry in the field I was told that the following forage ration was being furnished:

Barley	quarts..	7½
or oats.....	do.....	11½
Hay	pounds..	2½
Green bush clover, a tender shrub growing about 18 inches to 2 feet high, and of which the horses are fond.....	pounds..	24. 84

The troopers frequently took their horses out to graze, holding the lariat in the hand.

DRILL REGULATIONS.

On the occasion of a visit to another regiment of cavalry, some of the troops were turned out to drill before me. I was taken first to where a squad was being exercised on a track laid out on the prairie. The men were spoken of as recruits, but inquiry developed the fact that they had received about seven months' training, including riding, previous to their

departure from Japan, and that they had joined their regiment about a month previously. They had saddles and were riding with the curb and snaffle bits and wore spurs. They were executing movements common to our drill regulations, such as "circle to the right," "first trooper from front to rear," and moving to the right and left about, etc. Their seats were decidedly faulty, and the two officers who were superintending the drill made no effort to rectify this error. The toe is almost invariably turned out at an angle from 45 to 60 degrees with the side of the horse. This fault is so common that it must be due to the conformation of the man, whose buttocks appear to be abnormally large and whose upper leg is large and round. Many men in the squad mentioned had both spurs against the horse, and the same was true to a considerable extent in the squadron drawn up near by. The squadron was formed in double rank, and was divided into four sections or platoons, three of them being commanded by lieutenants and the fourth by a "probationary officer," previously mentioned. The normal strength of the squadron is 141, but on this occasion only 112 paraded. It was said the others were recruits or old soldiers performing various duties. The squadron marched past in column of sections, corresponding to our column of platoons, and in double rank. The alignments were good. The review was followed by a drill in close order that was fairly good. Then a position was marked out on a hill to represent the enemy, and the squadron formed about three-fourths of a mile distant to execute the charge. At a given signal it moved forward, taking the different gates in succession, and passed to the charge about 150 yards from the position mentioned. Part of the line had to charge through a field of kaoliang, which is about as difficult to pass through as one of our cornfields, for while the stalks are not as large in diameter as those of the Indian corn, they are much higher and stand closer. In the charge the men in the front rank took the position of "charge" and those in the rear rank of "raise saber." The line broke some, of course that part in the kaoliang, but not badly. The charge ended, the troopers were dismounted to fight on foot, quickly, but with more or less confusion. They took extended order and laid down and commenced firing. After this the command "mount"

from European ideas about cavalry, although it is believed they have a much clearer conception of what can be accomplished by the dragoon than they had on the outbreak of the war. Nevertheless, cavalry was frequently held in reserve in rear of the infantry, when according to our idea it could have accomplished much more had it been placed in advance, or sent to the flanks of the enemy, or to break his line of communication. A colonel of a regiment of divisional cavalry was quite emphatic in the statement that the higher authorities had not handled his arm of the service understandingly.

The war affords, as stated, but one instance of a cavalry raid having been made on a large scale, namely, Mishchenko's on Newchwang (Yinkou), and it has already been pointed out that if that general had acted promptly on arriving before the place he could have done his enemy a serious damage in the destruction of vast quantities of supplies. It is only fair to say that several Japanese officers of rank stated to me on various occasions that had they possessed the superiority in cavalry that the Russians had, they would have made it very difficult for their enemy to have maintained his line of communications. The raid, however, was usually spoken of as of secondary importance for cavalry. While it and the ideas of Stuart and Sheridan about placing their troops in the van of their respective armies, or of attacking the flanks or the rear of the enemy while a great battle was on, fighting on foot if necessary with all the vigor of infantry, had a place in the minds of the Japanese cavalry officers, yet these duties were not given the importance assigned to them in this country. One exception, however, is gladly made to so much of the foregoing remark as refers to the use of cavalry in action. A competent authority states that at the battle of the Sha River, Prince Kanin, with a brigade of the "independent cavalry," aided by four machine guns, attacked the left flank of the Russians and turned the day there in favor of his countrymen. It may be that if an opportunity had presented itself for me to accompany and study the work of the independent cavalry brigades I might make more exceptions, but the instance narrated is the only one of which I heard.

Certainly from the standpoint of Stuart, who rode around his enemy; of Buford, who, at Gettysburg, held the advancing legions of Lee at bay for hours and until the infantry of the Army of the Potomac could reach the selected battle ground; of Sheridan, who cut loose from Meade and moved directly on Lee's communications near the North Anna, and finally of Forrest, who was wont "to get there first with the most men" and who was in his element when in a precarious position breaking his enemy's communications—certainly, I say, in the light of the work accomplished by these distinguished leaders, neither the Japanese nor the Russians can be said to have handled their cavalry to advantage, and it is believed we have nothing to learn from the Russo-Japanese war about the proper use of that arm although we may derive many useful lessons from a study of the systematic training that the Japanese gave their men, and we will do well to adopt their remount methods or something similar. I am of the opinion that the permanent assignment of cavalry to divisions of infantry was a mistake, and that in this way its usefulness was frequently frittered away, just as it was under like conditions in the early part of our civil war. Undoubtedly infantry divisions and corps will often require the assistance of cavalry and it should be furnished liberally on such occasions, but if the civil war taught us anything on the subject it taught that this assistance should be given by regiments detached for the particular time and purpose and that the cavalry should be handled as a special arm, combined in one body and under one head.

It is believed, however, the Japanese now appreciate the superiority of the dragoon over either the cavalryman pure and simple, or the mounted infantryman, and that another war will see them handle their dragoons in a manner that will recall some of the best work done in our civil war. They will have more men mounted and on better horses, and it is likely that horse artillery will be attached to the cavalry, and probably machine guns as well.

In the South African war there was much talk of mounted infantry, and in America the propriety of replacing cavalry by it is not infrequently heard, but the fact should not be lost sight of that for more than fifty years our cavalry as been in

all essential particulars "mounted infantry," only with something added, namely, the ability to fight on horseback. Those who are fond of recommending that mounted infantry be substituted for our dragoons should remember that such a change would only result in disposing of men whose training includes fighting on foot, and in replacing them with another class who will fight no better dismounted and not at all on horseback. Our dragoon is a man who can and who has fought both mounted and dismounted and who is the type toward which Europe and Japan are certainly tending. Again, if the creation of mounted commands is to be left until the emergency arises in the midst of a campaign, the infantry may expect to see their best regiments taken for this duty just at the time they need them most. Unfortunately some of our people, in and out of the military service, too often express the opinion that cavalry can be quickly organized and trained on the outbreak of hostilities. This is an error that we should constantly strive to correct. Our dragoon is all right, and we will be wise to recognize that fact. The improvements that have been made in firearms since Appomattox have not lessened his usefulness. Let us continue to train him in the use of his rifle, remembering that in the spring of 1864 Stuart telegraphed to the authorities in Richmond to look out for Sheridan, whose cavalry fought better than the northern infantry, and also to use his saber in order that we may not find ourselves in the position of Early in the Shenandoah Valley when he said his mounted infantry could not meet Sheridan's cavalry successfully because they had no sabers. Finally, let us not forget that in the spring of 1864 General Grant said a new regiment might be worth something on foot, but not even its forage on horseback. It is believed, however, that we should attach to our squadron a 1-pounder automatic gun. This gun has for this particular service great advantages over the smaller caliber machine gun, although it has the disadvantage of not being able to use in an emergency the ammunition supplied for small arms. It has, however, a greater range and is a much better range finder for small arms; its usefulness in this respect having been clearly demonstrated in South Africa. The gun should be liberally horsed in order to enable it to accompany

the cavalry. In reconnoitering, or while covering other troops in the column of march, cavalry is often exposed to long range fire, and without a rapid-fire gun of some description with a range greater than that of small arms, the enemy's fire can only be checked by long movements to the flank, or by driving him from his position by dismounted fire, and the advance may thus be indefinitely delayed. In such instances it is believed a 1-pounder quick-fire gun will produce excellent results. Such an arm will also be useful in clearing hills and ridges of small detachments of the enemy's cavalry. Moreover, the moral effect produced by the pom-pom is considerable, for if one shell strikes near a detachment the men realize more are coming in the same vicinity. In recommending these guns for our cavalry it is not intended that they should supplant the horse artillery, which should accompany large bodies of cavalry whenever practicable. It is seldom that artillery can not get up to assist the infantry, but it often happens that cavalry has to go into action without waiting for its field guns. The 1-pounder is comparatively light and easy to transport, as well as more difficult to locate, for its discharge throws up but little dust, and for these reasons it may be used on occasions to greater advantage than a gun from a horse battery.

I could not learn that any of the Japanese cavalry officers wanted entrenching tools, but when they further develop the use of the dragoon this matter may be viewed in another light. I am of the opinion that our troopers should be so equipped; they must be if they are to fight to the best advantage. To compensate for the additional weight we may well do away with the picket pin and side lines.

ARTILLERY.

Attention is invited to what has been said in Chapter III about the organization of the artillery, and the guns used by the Japanese in Manchuria.

The Japanese horses are entirely too light for artillery purposes, and even if they had been properly driven it would have been impossible to maneuver the batteries at high speed on the battlefield. It may be questioned, however, if this

is longer of much importance. Ordinarily in these days artillery goes into action at such a great range that the necessity for rapid movements does not exist as often as formerly, and more especially as the batteries frequently seek cover with the intention of using indirect fire. In addition to the inferior horses found in the batteries, the Japanese were at the disadvantage of having poor drivers, although much time is spent in instructing them. As a nation, the Japanese are not horsemen and do not take naturally to that kind of work. I remember seeing on one occasion a battery on the march with several teams stalled on a muddy hillside. They were delaying a hundred or more transport carts, as the battery commander had stopped the latter in order to prevent any possible interference with his guns. Teams had been doubled until they had ten ponies to the piece. Ropes were hitched to the axles by means of which the cannoneers were assisting in pulling the guns out of the mud. There was much loud talking and no little confusion, but the men on foot were pulling with their utmost strength, while the drivers were quietly sitting on their ponies with the utmost unconcern, apparently making no effort to "drive together." Many of the ponies were not stretching their traces. As previously stated six ponies were assigned to the Japanese field guns and eight to the heavier pieces that had been captured from the Russians.

During the summer of 1905 the Japanese certainly expended artillery ammunition liberally in target practice. Every few days firing could be heard well to the rear of the lines of resistance. On one occasion I visited a regiment when practice was being held. The firing was first direct and later indirect. Only one battery was engaged, but all the officers of the regiment were present to observe and take notes and also the chief of artillery of the First Army, a colonel. A bright young major was superintending the practice, the captain, of course, having immediate charge. There was a battery telescope, binocular, mounted on a tripod. It had no graduated arc to measure angles. First, in the direct fire, it was assumed that friendly infantry was retiring in the valley near by, closely pursued by the enemy. Prominent land marks were taken to represent the friendly infantry and the enemy, respectively, and the captain was

told to get the range and open fire promptly. The first estimate of the range was faulty and the earlier shots would have made it uncomfortable for the friendly infantry if it had been there in reality instead of in imagination. The range was not quickly found, and in explanation several officers said there were a great many new men in the battery who had not yet become expert in handling the guns. In the second problem, indirect fire, hostile infantry and artillery were assumed to be in position on a ridge at an estimated distance of 5,500 meters. The first shots fell far short and the range ultimately proved to be 6,500 meters. Gun pits had been dug, and also pits for the cannoneers. In laying the first gun two iron stakes aligned on the target, or objective, were driven near the top of the ridge behind which the battery took cover, and the gun was then aligned on them. On the breech of the gun was a small detachable steel circle divided into 360 degrees. It had two folding arms with slits in them through which to sight. In short, it was a surveyor's compass minus the needle. The piece having been aligned on the stakes, the angle between the axis of the piece and a distant object on the flank of the battery was read, after which the other guns were placed at a like angle with the distant object. It was stated that this was the usual method for indirect laying.

The gun detachments consisted of seven men.

As might be expected, some regiments presented a much better appearance than others. The horses in the Fifteenth Artillery were the best that were seen in the army, and the drivers in this regiment seemed to be better instructed than those in others observed, and the harness and carriages were better kept. The colonel of this regiment said that on one occasion some of his guns accompanied the assaulting infantry to within 600 meters of the enemy. He added, however, that the ground was such as to afford some cover.

The officers in the Japanese field artillery fully appreciated the fact that the Russian guns were better than their own, and they were not slow to form batteries with those captured. The latter were frequently drawn by large horses also captured from the Russians, but where these were lacking Chinese ponies were substituted. In these batteries the har-

ness was sometimes partly Russian, partly Japanese, and largely makeshift, the emergency in this direction being met as best it could.

The Japanese field gun fired from 6 to 7 shots per minute, while the Russian gun is said to have fired 23.

It was said that the First, Second, Third, Fourth, Sixth, Tenth, and Guards divisions had field guns, the Fifth, Eighth, Ninth, Eleventh, and Twelfth mountain guns, and that the regiment with the Seventh Division had one-half field and one-half mountain. Thus, of the original thirteen divisions, seven had field and five mountain guns, while one division had one-half of each. It is believed, but not known certainly, that the kobi division in the Fifth Army and each of the four divisions organized during the war had a regiment of artillery attached, but the proportion of field to mountain guns in these regiments is not known to the writer. It will be remembered that in addition to the divisional artillery there were two artillery brigades, each of three regiments of two battalions of three batteries, all field.

The Japanese made a great feature of indirect fire. This statement is particularly true of the mountain batteries. As the war progressed, the Russians also saw its advantages and used it more frequently. It seems to be accepted as a fact, that while the Japanese had an inferior gun they obtained better results by taking greater care to conceal it and firing more deliberately and thus securing greater accuracy. It was said, too, that the Japanese shrapnel had a greater accuracy of burst. According to Japanese officers the Russian batteries frequently changed position needlessly, and often fired one gun and, without waiting to observe the effect of the shot, followed it in quick succession by the other guns of the battery, and that in this way they wasted great quantities of ammunition. It is also believed they often expended ammunition uselessly in searching the hills.

The Japanese habitually verified the estimated range with shell which on bursting gave out a yellowish vapor. The effect of their high explosive shell is enormous, mangling the bodies of men struck so as to make it difficult to determine to what trunk the scattered limbs belonged. This shell was often used to good advantage against earthworks. The Russians had no shell with their field batteries, only shrapnel,

The experience of the Russo-Japanese war is believed to have demonstrated that the best results in the use of field artillery can be secured by massing the batteries rather than scattering them to beat down the enemy's fire.

For reasons that have been stated under the head of "infantry" it is thought the guns on the offensive can greatly assist foot troops advancing to the attack, while the latter will not ordinarily meet with as heavy losses from the guns of the defense as is generally imagined. In the attack the moral support given by the artillery to the assaulting infantry is a great and often the determining factor of success.

A general officer of the Japanese army said to me that "the effect of artillery fire is more of a moral than a physical nature, but that in war moral forces count much more than in peace. To new men in their first, second, or third fight the moral effect of artillery is very great, while the old soldier dreads it less." While there are occasions doubtless when this remark holds true, it will be unsafe to assume that artillery does not secure positive physical results, and in the future all arms must expect to meet with heavy losses from its fire. The heaviest percentage of loss heard of from artillery fire, as compared with that from small-arms fire, was in that part of the Second Division at Liaoyang which was subjected to an unusually heavy cannonade; it was about 13 per cent.

THE REORGANIZATION AND THE RECRUITING OF ORGANIZATIONS TO THEIR MAXIMUM STRENGTH AFTER ENGAGEMENTS AND BATTLES.

No one can read the histories of our wars without appreciating the vast amount of labor and confusion that has accompanied the reorganization and recruiting of regiments and batteries to their maximum strength after a campaign where heavy losses have been encountered, and those who have had experience in this matter are not likely to forget that when the organizations were refilled the new members were not soldiers, but men who had to be converted into such as soon as time and the enemy would permit. In the Japanese army, however, this important detail of army administration had been carefully provided for in advance and

worked with clocklike precision and smoothness. It may be described in a few words. The different regiments of infantry, cavalry, and artillery, and the battalions of engineers each had its depot in Japan where recruits were being hammered into soldiers during the war. These men were not gotten by haphazard, but were duly named and called to the colors at a prescribed time by the terms of the conscription law, the working of which had been fully tested before the war. It is known that in instances conscripts were held six months at depots undergoing instruction before being sent to their respective regiments in Manchuria. When they joined in the field they knew how to drill, to march, and to shoot, and had already been instructed in the simple but important rules necessary to the preservation of health. In no instance, either at the commencement of the war or later, were raw officers and men dumped down into hastily selected camp grounds, as has too often been the case with us, there to contract disease while slowly and laboriously acquiring the elementary principles of the military profession, including camp sanitation, and this, too, when we possessed such a small number of trained instructors that of necessity the blind were frequently left to lead the blind.

When men were needed in Manchuria to fill an organization to its maximum strength, the commander, usually a colonel, telegraphed the number required to his depot in Japan, and officers there immediately started a detachment of trained soldiers to the front. Frequently the necessity for these recruits was anticipated, as when a great battle was imminent, and, without waiting for the ranks to be depleted, troops were started from Japan in time to arrive while the battle was on or immediately thereafter, so that the Russians in retreating sometimes found as strong an enemy to hold back as they had encountered in the previous battle. It must be admitted that this is making war on businesslike principles.

PONTONS.

The Japanese army was supplied with pontons well adapted to use in Manchuria, where it was necessary to transport them long distances by carts or on pack ponies.

It will be recalled that the pontons in each division are handled by the engineers attached thereto. So far as known,

each bridge company or section had material sufficient to construct a bridge 144 meters in length.

The ponton boat is 24 feet long, 4 feet 1 inch wide, and has a buoyancy of 5,511 pounds. Its carrying capacity was generally stated to be insufficient and it is probable that its dimensions will be increased. It may be divided into two buoyant halves and each half into three sections. A special cart drawn by one pony is provided to transport the half boat, or if the latter be broken into sections three pack ponies are required. The weight of a section is about 125 pounds.

Each half ponton is strengthened with wooden crosspieces, the center one being supported by an iron upright kept in place by two iron rods which connect the top of the upright with the bottom of the ponton. The boats in the bridge are placed 3 yards and 9 inches apart, from center to center.*

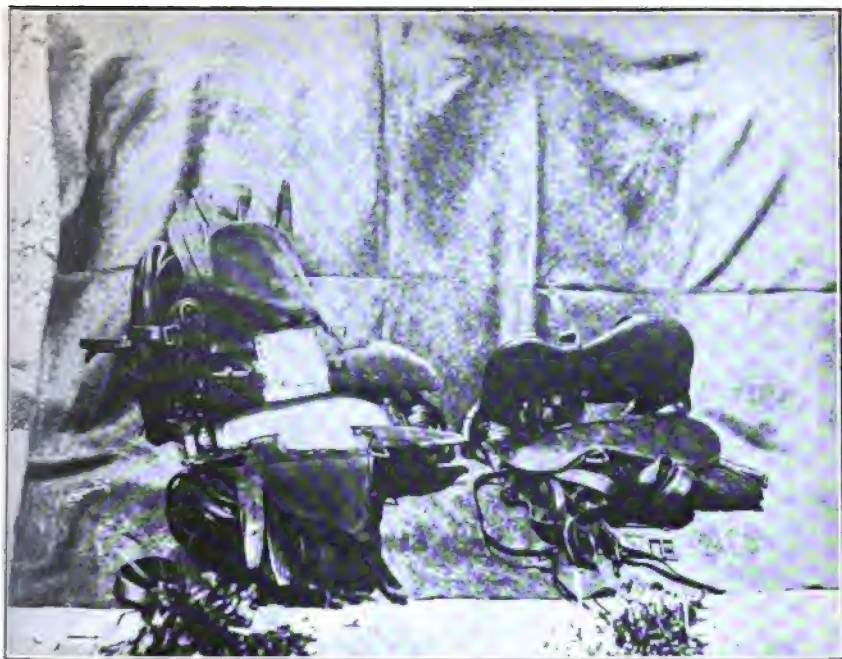
The ease with which these boats can be transported over bad roads and through the mountains permits of their being used on many occasions when it would be impracticable to get up the heavier ponton which has heretofore been employed in our service.

PACK PONIES AND PACK SADDLES.

Pack transportation in the Japanese army is handled very differently from the way it is in ours. With us twelve or thirteen good packers will care for, pack, and handle well 40 pack mules. In the Japanese army a man is assigned to each pack pony. Our system undoubtedly is superior in the matter of transporting loads on the march, while the other gives better results in the few instances where pack trains have to be taken under fire.

The pack saddle is primitive, but it will carry almost any kind of supplies—bales of hay, bags of rice, intrenching tools, ammunition, machine guns, barrels of sake, etc. The form of the saddle is identical for all of these purposes, and it is built as follows: Two wooden side bars rest on pads stuffed with hair. The pads are of leather on top and canvas below. Each is fitted to the side bar like the similar pad on the enlisted man's saddle; that is, there are leather pockets in rear and front to fit over the ends of the bar.

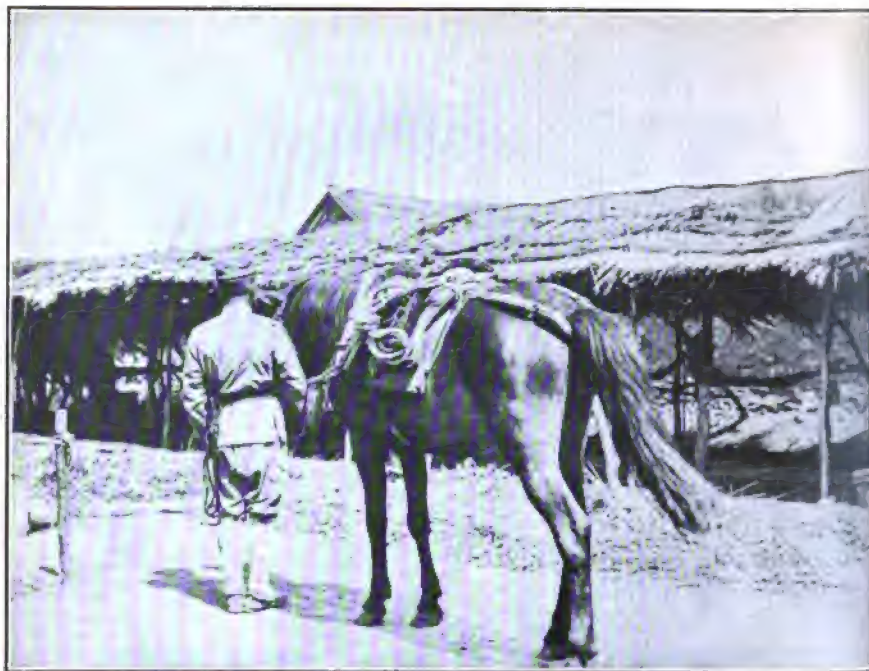
* Photograph No. 23 shows the ponton boat.



22. JAPANESE AND AMERICAN CAVALRY SADDLES, FORMER STRIPPED OF PAD.



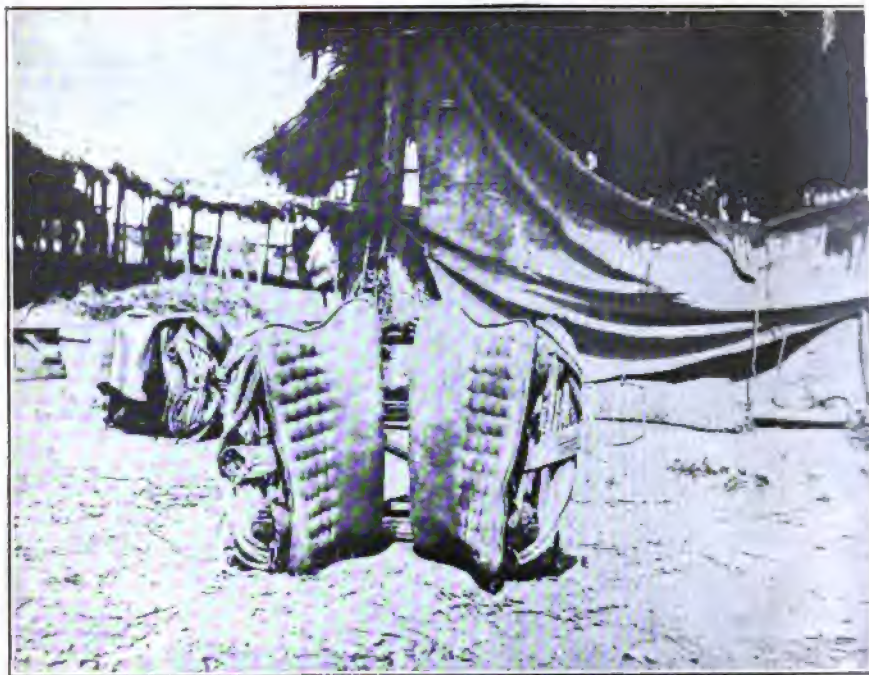
23. SHOWING DETAIL OF CONSTRUCTION OF PONTON BOAT.



24. PACK PONY AND SADDLE WITH TRANSPORT SOLDIER.



25. PACK SADDLE AND LASH ROPES.



26. PACK SADDLE, SHOWING PAD.





28. PACK PONIES AND TRANSPORT SOLDIERS.

the one in front being fastened by a strap and buckle.^a Above the side bars and fitted to them are two crosspieces of iron, one of which might be termed the pommel and the other the cantle of the saddle. On both sides of these iron bars or frames, about 2 inches from the top of the arch, is an iron hook placed to the front of the pommel frame and to the rear of the cantle. These hooks are riveted to the frames and extend downward along them, the open end of the hook up. They are $2\frac{1}{2}$ or 3 inches long and are used to hold an iron ring, about an inch and a half in diameter, which is fastened to the lash rope by a short chain, perhaps 8 inches long. There are two lash ropes, one for the pommel and the other for the cantle end of the saddle. On each side of the latter and above and at right angles to the iron frames is a strong piece of wood with a rectangular cross section. These sticks serve to stiffen the saddle, and, extending about two inches in front and rear of the said frames, to which they are permanently attached, are also useful in making the lash ropes fast. A blanket is used under the saddle in addition to the pads. The girth is made of strands of heavy cord, like that of the riding saddle, and, like it, is too narrow. A similar band is used as a breast strap. The saddle has a crupper. The fastening of the load is very simple, and the transport soldiers soon become expert in it. The transport pack saddle complete is believed to weigh about 41 pounds. The saddles used for transporting artillery ammunition and mountain guns are stronger, and, as stated elsewhere, are also heavier.

^a Photographs Nos. 24, 25, 26, 27, and 28 show various views of the pack saddle, both on and off the horse.

CHAPTER XI.

GENERAL REMARKS.

YOBİ AND KOBİ RESERVES.

These reserves are among the strong features of the Japanese military system, as they are composed of trained soldiers who are capable of giving immediate and efficient assistance to the active army. It will be remembered that the latter is brought up from the peace to the war footing by drafts being made on the yobi reserve whose members have had three years' service in the active army, and that the kobi reserve is composed of men who have completed their service in the first, or yobi, reserve. While the kobi reserve was largely employed along the lines of communication, it was always ready to acquit itself creditably in battle, and one division in the Fifth Army, as well as the reserve brigades assigned to the different active divisions, habitually operated with the active army. In time of war the regimental commanders in the last-named reserve are often taken from the active army, thus insuring these regiments being handled by officers who have received the latest training. It is understood that surplus officers allow of this being done without depleting the "active" regiments. During the war officers of the active army on receiving promotion frequently served for a time with the kobi reserve. In addition to guarding the lines of communication, this reserve also guarded the transport carts belonging to the different divisions, which were habitually placed behind hills 5 or 6 miles to the rear of the main line occupied by the active army. It would have been difficult for the Russians to have captured much of this transportation.

TACTICAL AND ADMINISTRATIVE DIVISION.

Another strong point in the Japanese military establishment is this division, which is complete in itself, administrative machinery included, so that in war it is prepared to act

independently. This is believed to be the correct system except as to the permanent assignment of the cavalry, but it can perhaps be applied to better advantage to a corps than to a division organization. Many Japanese officers expressed themselves as being in favor of establishing army corps, each composed of two divisions. In such an arrangement each sub-army would probably contain two corps.

Such supplies, not furnished from depot, as are required by the division in the field—medical, ordnance, and transportation (wagons and harness) supplies excepted—are purchased by the division intendant. This officer works with the division in time of peace as well as in war, and it is thus seen that the same machinery is used for providing supplies at both periods, whereas in our peace establishment many necessary supplies not furnished from the depot are purchased by the chief quartermaster or chief commissary of the geographical department, neither of whom belong to a tactical organization, so that when war is declared and the concentration of troops accomplished these officers can not exercise their functions further until upon arrival at a new station after having been assigned to a new position. Thus, their system looks to a continuance of the officer with the necessary supply machinery on the outbreak of war, whereas ours contemplates a change, which means confusion.

The chief intendant of a division submits annual estimates for supplies required.

The fiscal year ends March 31. Final accounts must be rendered to the war department by August 31, and by the latter to the treasury department by October 31.

The amount of money and supplies to be set aside for each division is made known by the war department to the division commander, who instructs his chief intendant to submit the necessary requisitions.

The following supplies for troops engaged in active service are habitually furnished from depots; all others, except medical, ordnance, and transportation supplies, are expected to be procured usually, as previously stated, by division intendants:

Food.—Prepared rice (iron ration). hard bread, canned meat, fish, salt, extract of soy (condiment), dried pickled plums.

Clothing.—All woolen goods, including blankets, also thick cotton ^a and linen cloths, shoes, knapsacks, water bottles, mess cans, shelter tents, and perhaps a few other similar supplies.

Purchases not exceeding 500 yen (\$250 gold) may be made without soliciting bids. Those for greater amounts require bids, as in our service.

PAPER WORK.

In the offices of the chief of staff, minister of war, and their assistants I was particularly impressed by the absence of the numerous bundles of papers so conspicuous in our departmental offices. Throughout the buildings all was invariably orderly and quiet, and there was a total absence of nonmilitary persons. The fact that the affairs of the Japanese army were conducted with much less writing than is the case with us was impressed upon me by observation on numerous occasions, and realizing how much valuable time is taken up in our services in such labors, and how it frequently interferes with the field duties of line officers, earnest attempts were made to inform myself on this subject.

It was stated positively that no written records are required in a company except one book, called "chutai meibo," translated as "company roll," in which is entered the names of officers on joining and leaving the company, the names of all killed or wounded, and of those sent home or to hospital, etc. Captains frequently keep a sick book and copies of letters sent, but these are kept as a matter of convenience, and not because the regulations require such records.

At battalion and higher headquarters a book called "jin-chu-nissish" (daily record of campaign) was kept. In this was entered everything of importance that occurred during the day connected with the command, including the substance of letters sent and received. It was examined daily by the commanding officer and made official by his seal or signature. Papers entered in the "daily record" were sent from time to time to the depot of the organization in Japan. It was in-

^a Presumably including cotton uniforms.

tended to examine them after the war and to destroy those of no value.

Ration returns were submitted daily. There is a blank of very simple form for this purpose, but in the field even this was frequently not used, the return being made out on a slip of paper.

Returns of strength are submitted as follows: In time of peace, daily, monthly, quarterly, semiannually, and annually; in war every ten days; and in battle company commanders report daily if practicable. Company returns are consolidated at battalion headquarters and then forwarded to the headquarters of the regiment, where similar consolidation is made, and so on up to include army headquarters. The blank used for company, battalion, and regimental headquarters is about the size of the company monthly return supplied in our service, but only one side thereof is ruled instead of both as with us, and only one-half of this, the lower half being left for remarks if desired. The return contains much less detail than ours, but all that is necessary to show the number of officers and men present and physically fit for duty.

In time of peace battalion headquarters, and presumably others, forward to the next higher headquarters one copy of all orders issued, but this is not required in war except when important matters are involved. In order to avoid unnecessary writing a battalion commander frequently assembles his captains and gives his instructions verbally; this practice is more common than with us.

The payment of the officers and men in the army of Japan is a simple matter when compared with the system we have, which requires a company commander to prepare, monthly, three complicated pay rolls, and in addition every second month two even more complicated muster and pay rolls. In Japan officers are paid monthly and noncommissioned officers and men every ten days.^a In the case of an officer, the money due is sent to him, together with a blank receipt, which he signs and returns to the paymaster. The noncommissioned officers and men are paid by a noncommissioned officer, selected

^a For the pay of the Japanese army see Appendix.

for this purpose by the battalion or regimental commander. He receives the money for the payment of the company from the battalion paymaster, to whom he receipts. Each soldier has a handbook, and when he is paid the noncommissioned officer making the payment makes a proper entry in it by the use of a stamp. These books are examined from time to time by the company commander. If a soldier loses public property, he reports this fact to his captain and states the circumstances. The captain informs the noncommissioned officer detailed to make the payment of the soldier's statement and of his own knowledge of the matter. These statements are transmitted through the battalion paymaster to the battalion commander, who decides whether the soldier's pay shall be stopped to make good the loss. If the decision be unfavorable to the soldier, this fact must be reported by the battalion to the regimental commander. Property is seldom lost through carelessness.

REGIMENTAL COMMITTEES.

A peculiarity of the Japanese system is the regimental committees, created to deal with finance and supplies. These may well be considered in connection with the foregoing subject, "paper work." There are three such committees, or councils, in each regiment, as follows:

First. *Finance committee*, composed of a major, one company officer, and the paymaster, assisted by the necessary clerks.

Second. *Food committee*, composed of one captain, one lieutenant or sublieutenant, and the paymaster. In a cavalry regiment an additional sublieutenant may be added. The committee is assisted by clerks and noncommissioned officers.

Third. *Clothing committee*, composed of one major, two or three company officers, and the paymaster.

The colonel supervises all committees.

The first committee has charge of all the financial records of the regiment, while the cash on hand is kept in the custody of the paymaster. The committee on food submits monthly estimates of the amount required, and the committee on clothing submits annual estimates therefor.

The following are the records kept by the different committees as shown by the army regulations of 1905:

FINANCE COMMITTEE.

1. Cash book.
2. Ledger.
3. Receipt book.
4. Balance sheet.
5. Deposit book, accounting for the deposits made by "one-year volunteer officers."
6. Book accounting for payments made to noncommissioned officers and soldiers.

FOOD COMMITTEE.

1. Food-supply book.
2. Forage-supply book.
3. Book showing total number of meals furnished daily.
4. Issue (order) book.
5. Book indicating total amount of rice received.
6. Book indicating total amount of rice distributed.
7. Book showing forage received.
8. Book showing forage issued.
9. Food balance sheet.
10. Forage balance sheet.

CLOTHING COMMITTEE.

1. Daily record of clothing received.
2. Daily record of clothing issued.
3. Issue (order) book.
4. Requisition book for clothing to be supplied.

IMPEDIMENTA AND THE INFANTRYMAN'S PACK.

It is thought the impedimenta in the Japanese army was reduced to a minimum. The allowance of baggage for officers, which so frequently grows to undue proportions, was carefully prescribed as was the size of the trunk permitted to be taken into the field.^a Each of these trunks made a convenient side pack for a pack saddle. If, however, the impedimenta was comparatively little, the pack of the infantryman was unduly heavy, and if the marches had been long

^a The military attachés were treated liberally enough, each being allowed 165 pounds for his baggage and that of his servant.

and continuous this would have been a discouraging feature in the campaign to the Japanese soldier. Troops were observed from time to time marching with full packs on hot summer days, and it required only a casual inspection to discover that the men were often greatly fatigued and that their bodies ached because of the heavy loads. The unyielding knapsack especially seemed to annoy.

REGIMENTAL INSIGNIA.

In Manchuria, the regimental numbers were removed from all parts of the uniform, which rendered it difficult for the Russians to determine to what organization persons taken belonged, and incidentally the absence of these numbers also made it difficult for the attachés with Oyama's army to identify passing regiments. This plan worked well with the Japanese, but it is doubted if it would be as successful with American or European troops who are not always as orderly as those of Japan, making it desirable at times to determine the organization to which men belong. Moreover, the soldiers of the west have little that corresponds to what we may call the esprit de corps of the former clan in Japan, which still makes itself felt in their regiments, and for this reason the armies of occidental nations require that their regimental esprit de corps be cultivated in other ways, one of which is to keep the names or numbers always to the fore, so that every observer may know the organization to which a man belongs.

In America, however, there is a creditable State spirit and emulation, which have been displayed on innumerable occasions in war, and it is believed we make a serious mistake in not utilizing them in our regular service by localizing the districts from which recruits shall be drawn for particular regiments. It would do much to create a local pride in particular organizations that would discourage desertion and in the end make many friends for the army.

HEALTH.

As is well known, the health of the Japanese army was remarkably good. This happy result was largely due to well thought out regulations on the part of the medical

department, but was also due in no small measure to the healthful climate in which the campaign was conducted. The climate in Manchuria is very similar to that of Montana, although the winters are not so cold and the midsummers are sometimes warmer, but the air is ordinarily dry and invigorating. Again, with some notable exceptions, the Japanese did not make long and continuous marches. Usually, after marching 50 miles or so in several days, the army would go into position in front of the Russians and there remain for weeks. I was told by an attaché who saw the army in Korea that in the comparatively heavy marching to the Yalu there was much more sickness among the troops than later in the campaign. The very general use of boiled water undoubtedly accounts for much of the good health enjoyed. The regulations on this subject were carefully prescribed and usually obeyed, although on hard marches in hot weather the soldiers were seen drinking occasionally from wells where the water must have been impure, and to eliminate this danger as much as possible drinking stands were erected in the summer of 1905 along the roads in rear of the positions held by the army, where passing soldiers could get boiled water. To make this more palatable barley was commonly added. These stands were covered to give shelter from the sun and contained a sufficient number of seats to accommodate small squads. One or two soldiers were assigned to duty at those drinking places whose duty it was to keep boiled water on hand. This is only cited as one of the precautions taken in this very important matter.

The army also had the advantage of being fed largely on rice, a food to which the soldiers had been accustomed from infancy, and one which all Japanese understand how to prepare, and so on going into the field there was no material change in the diet of the men. In the earlier part of the campaign there were frequent cases of beriberi in different parts of the army. This disease is thought by many to result from eating too much rice, and the authorities claim to have greatly reduced the number of cases by mixing barley with the rice in the proportion of three parts of the former to seven parts of the latter. The field ration was much improved by adding fresh vegetables in liberal quantities

when obtainable. It is believed that much sickness was also prevented by having the soldiers sleep in houses, provided they had time to clean them properly, instead of on the ground, as is common with us. Of course the thorough training of every soldier in Japan, before he was sent to the front, and the abstemious habits common to the Japanese had much to do with the good health enjoyed. During the latter part of my stay with the army the number of sick men seen being carried on litters along the roads to the hospitals materially increased, and cases of typhoid fever were frequently heard of. As much of the summer had been very warm and the flies numerous, the increase in that disease was possibly unavoidable. In the middle of August I was told by a surgeon in a kōbi regiment, whom I had authority from headquarters to consult, that the prevailing diseases were diarrhea, typhoid and beriberi, but that the cases were not numerous. In speaking of the ration he said he thought it was satisfactory, but that the medical officers would continue to study the subject. While rice may be, and doubtless is, an excellent ration for an oriental army, it would not answer in our service, or in the greater part of Europe, for the men simply would not accept it.

In each company a noncommissioned officer was detailed daily to look after the health of the men. There was also a soldier with the rank of corporal who acted as company nurse, who wore the usual Red Cross band on his arm. The fact that a company sick book was frequently kept as a matter of convenience indicates that our custom in this respect is correct. In the field the battalion surgeon renders a report of sick every ten days, and also a monthly report. These he transmits to the battalion commander, who forwards them to regimental headquarters, and they finally reach the chief surgeon of the division through military channels.

The surgeons frequently gave lectures on hygiene to the men, and the importance of cleanliness, including the washing of the mouth, was invariably dwelt upon. Careful instructions were prescribed concerning the clothing to be worn in different temperatures, and the necessity for keeping the socks clean and dry was impressed upon the infantrymen. The foot troops were cautioned to wash their feet frequently, and the mounted men to wash the inner side of the thigh

and buttocks. All soldiers were cautioned about taking a proper amount of wholesome food, but to avoid overeating and drinking to excess. One important rule was not to eat when tired or hot, but to wait on such occasions and rest a short time before taking food. The danger of eating uncooked fresh vegetables and drinking unboiled water was repeated again and again. Soldiers were told to fill the water bottle with boiled water or tea before marching, but to drink as little as possible on the road. Instructions were given as to the proper manner of treating a comrade suffering from sunstroke, and also from frozen extremities. They were informed that when tired energy might be recovered by rubbing the feet with wet cloths and washing the hands, face, and neck in cold water. The danger of infection from flies was dwelt upon, and the necessity for properly dug sinks in which to cover human excrement was pointed out. The rules to be observed when quartered in tents were also mentioned, but as little canvas was used these regulations did not play an important part. Finally the danger of contracting gonorrhea and syphilis in a country where the people are so habitually dirty as in Korea and Manchuria was plainly pointed out.

RAINY SEASON IN MANCHURIA.

As has been stated, the climate of Manchuria much resembles that of Montana, and in the general features of the landscape the countries are not dissimilar. In summer, however, the rainy season in the former is more pronounced. In the early part of June, 1905, there were occasional heavy rains, and a number in the latter part of the month. In the first half of July the rains were frequent but with sufficient clear weather between them to enable the sun to keep the roads in fair condition. In the last half of July and up to the 7th of August downpours were of almost daily occurrence and the roads were nearly impassable. In places it was dangerous to ride or walk over them after dark because of the deep ruts, holes, and washouts. After the date last mentioned there was no heavy rain until September 1, and after that the weather was pleasant until the time of my departure on the 22d of September. The natives said that less rain than usual had fallen during the summer.

On the 5th of August a general of division informed me that he was experiencing much difficulty in supplying his troops because of the bad roads. He added that if peace was made the Japanese were ready with men and supplies to advance as soon as the weather would permit.

JAPANESE OPINION OF THE RUSSIAN ARMY.

The general impression during the summer of 1905 among the Japanese was that the Russians would not stand for a great battle, but by offering temporary resistance at successive positions would endeavor to prolong the war, with a view of drawing the Japanese farther from their base of supplies and of exhausting their financial resources. They were of the opinion that the morale and discipline of their enemy had improved under general Linevitch, but, rightly or wrongly, they held that he was not as able a strategist as his predecessor, Kuropatkin. While they would have welcomed an attack by the Russians, it is believed the higher officers appreciated the danger of further prolonging the war. They reasoned that if the Russians stood for a determined fight, the sacrifice of life to the Japanese would undoubtedly be great, with perhaps no better opportunity to give their enemy a decisive blow than at Mukden, for the question of supply still required that the attack be delivered from the front, which would probably enable Linevitch, if beaten, to fall back along his line of communications, which was also his natural line of retreat. On the contrary, if the enemy adopted the policy of a temporary resistance at successive positions to prolong the war in that way, the accumulating expense would be such as to heavily strain any country and especially one no richer than Japan.

The opinion that the Russian soldier was brave, but that his officers were inefficient because of loose habits and the lack of professional training, was heard expressed so frequently that it is believed the policy of the Japanese must have been influenced by this view.

SKIRMISHING WHILE NEGOTIATING FOR PEACE.

Affairs of the outpost and heavy skirmishing continued throughout the summer and almost to the day that peace

was declared. In the interest of humanity it is to be regretted that a truce was not made while the preliminary arrangements for the meeting of the peace commission were in progress and during its sessions, but each army seemed to fear that its opponent might secure an unforeseen advantage, and the commanders thought it wise to feel the opposing line from time to time to determine its position and strength. During the summer the Russian cavalry, perhaps because of its greater numbers, displayed more activity in reconnoitering than did that of the Japanese. On the 5th of August about 600 of the former approached the front of the First Army and reached a point about 5 miles from the main line of resistance. They fell into ambush, however, and were driven back, it is said, with a loss of 40 killed and wounded, while the Japanese sustained no casualties. In the same month a company of infantry from the First Army being sent out to reconnoiter was surrounded and only nine men escaped. As was stated by a Japanese officer this was an unusual experience in the war for their troops. These are but two instances of the skirmishing that was constantly going on. Over on the left of the grand army some of this fighting was quite severe.

CHARACTER OF THE JAPANESE SOLDIER.

To appreciate an army at its true value, it is necessary to study the character of its personnel. Intelligence, patriotism, abstemiousness, obedience to, and inborn respect for, legally constituted authority go far toward achieving victory. When to these we add physical strength, a love of nature and of manly sports, modern organization, armament, equipment, and careful military training we have an army that will give a good account of itself. All of these were found in the Japanese army. When viewed from our standpoint of general and world-wide information, the intelligence of many of the Japanese privates may not seem to be of a high order, yet there were few who could not read and write. The accomplishments, combined with the worship of their warlike ancestors and the study of their martial deeds, enabled them to view the war with its sacrifices and military necessities in its proper light, and to properly appreciate the

part they had to enact therein. No one who served with the Japanese armies in Manchuria failed to be impressed by the seriousness with which the junior officers and the enlisted men looked upon their duties, and their intelligent efforts to perform them satisfactorily.

That the Japanese are abstemious is a well-known fact, as is their respect for their superiors. Their love of nature, their fondness for innocent amusements, and their worship of the spirits of their ancestors and heroic dead may not be so well understood, and an explanation of these traits of character may serve to give a better understanding of the soldiers who fought under the banner of the rising sun.

It requires only a short stay in Japan to learn that its people have an innate love for nature. The soldiers of Oyama's army never tired of strolling over the mountains or through the valleys of Manchuria picking wild flowers, if in season. They found positive delight in beautifying the yards in the uninviting Chinese villages in which they were quartered, and they would work for hours in making walks, marking out and digging flower beds, and in bringing in small trees from the hillside with which to beautify their surroundings.

For centuries the Japanese have combined pleasure with training in fencing bouts, and while the army was lying in position awaiting the next move on the great chessboard of war the soldiers would often get out their masks and fencing sticks and pass hours in this exercise. After observing their fondness for and skill in fencing one could more easily understand their many successes in hand-to-hand encounters with their larger adversaries. On a visit made after my return from Manchuria to a depot near Tokyo, where conscripts were being trained for the First Regiment of the Imperial Guards, I saw 50 men turned out to fence with wooden muskets. The bouts terminated by dividing the squad into two equal parts, after which the detachments were formed 50 feet apart, and when the signal to engage was given they moved on each other so violently that many men were overthrown, and it was, in fact, a desperate hand-to-hand struggle; only the padded jackets and blunt bayonets prevented serious injury.

In wrestling, too, they found great delight, and would labor hard in preparing a ring and its accessories for matches, over which they would become wildly enthusiastic. Dozens of men would participate in these contests, usually in couples, but sometimes in groups. Stripped to the waist, they would come together like steam engines, and often the falls were hard, but usually the utmost good nature prevailed.

The Japanese earnestly desire to win the regard of the spirits of their dead, especially of their heroic dead. This feature of their religion is not a mere form, but produces a profound impression on the minds of the people, and especially among the soldier class. No opportunity was lost in the field to inculcate in the soldier's mind the idea that he should be worthy of those who had already laid down their lives for the fatherland. With a view of giving some conception of the solemnity with which this lesson was taught on occasions, the following description is given of a ceremony that took place in the Umesawa brigade on the first anniversary of the battle of Liaoyang:

It was my good fortune to be invited to participate in these memorial services. The brigade commander, his staff, and the invited officers advanced along a smooth and broad road prepared for the occasion, on either side of which troops to the number of 2,000 or 3,000 were massed under arms. The road led to an altar, decorated with real and artificial flowers, standing on a hilltop that rose about 100 feet above the troops. The altar was laden with fruits, vegetables, and other food tastefully arranged as an offering to the dead. On reaching the foot of the altar General Umesawa, his staff, and some of the officers of his command formed on its right (facing the troops), while the officers invited from other commands, myself included, formed on the left. Four priests, wearing handsomely embroidered robes, approached the front of the altar and, after bowing profoundly, formed in line facing it. They then chanted from the writings of Buddha. This ended, each priest in turn advanced to the altar and taking from a small box thereon a few tiny pieces of wood, placed them on some lighted charcoal as a burnt offering. The substance burned looked like kaoliang seed, but the statement was made that it was customary on such occasions to

use a certain kind of wood broken into small bits. The priests then formed two on either side of the altar, when General Umesawa stepped between them and facing it made a low bow. The trumpets sounded and the troops presented arms. It was a solemn and impressive spectacle, even to myself, who did not share the belief of the Japanese about the presence of the spirits. The general then proceeded to read a written address to the spirits of those who had fallen in his command at the battle of Liaoyang. This finished, he bowed again and with cap removed advanced to the altar and burned an offering, after which he retired, keeping his face toward the altar for some distance, as had the priests before him. The general was followed in succession by the officers who accompanied him, each of whom went through the same ceremony as the brigade commander, only no other address was made. They were followed by some junior officers who had formed lower down on the hillside, each of whom advanced to the foot of the altar, bowed, and retired without burning an offering. At this time the general sent word to me by a staff officer that he would be glad to have me pay my respects to the dead. I deemed this a high and an unusual compliment, and gladly and reverently accepted the invitation. No soldier who participated in that ceremony could have failed to have been impressed by the solemnity of the occasion, or to renew his vows to defend his country's flag.

After leaving the altar the general invited a number of officers, myself included, to accompany him about the grounds to inspect the various arrangements that had been prepared to amuse and instruct the soldiers, for this was a holiday as well as a memorial day. We entered little summer houses in the midst of artificial lakes, tents where something or other was displayed to amuse or instruct, and a rudely-constructed theater building. In the river near by there was a battle ship about 150 feet long, with other dimensions in proportion, built of light pieces of timber covered with khaki shelter tents. The ship had imitation smokestacks and a turret. Out of the latter two big guns protruded. The smokestacks and guns were made of Chinese matting.

There was also a piece of ground, about 40 by 50 yards in extent, laid out to represent the ground over which the brigade approached and fought at the battle of Liaoyang. It

was accurately laid out on a scale of 1:500. Little sodded mounds showed the mountains, and in the valleys the villages were represented in proper positions. The mountains and valleys were constructed to scale from a contour map. Where the fighting had been severe figures of dead men and horses were placed. Near this ground were trenches and bombproofs, all neatly and accurately constructed according to a small scale. The soldiers who had joined since the battle were taken over this model and shown just where the different lines were formed and how cover was obtained, and thus, while it served to give excellent instruction, it also reminded the young soldiers of the heroic dead they had but a few moments before been worshiping. To prepare this miniature battle ground had taken the labor of 200 men for ten days.

That the Japanese soldier will cheerfully engage in such labor as is described above seems to me to mean much, for in this way he finds amusement for days at a time in healthful outdoor labors, much of which time, in many other armies, would unfortunately be spent in dissipation if opportunity offered. The simple character of the Japanese soldier, his cheerful disposition, and the innocent amusements in which he engages largely lessen the labors of his officers.

The excellent discipline of the Japanese army arises as much perhaps from the character of the soldier as from his strict military training. As a people they are polite to one another. It requires no effort on the part of the authorities to cause a soldier to habitually salute his superior officer. This is done as a matter of course. Moreover, the authorities wisely took advantage of the cheerful dispositions of the men and their inclination to labor to keep them busy. When there was no marching or fighting that required the attention of the army, the troops were occupied in drilling, or at target practice, and later in working on the roads. A fair amount of occupation kept them cheerful. To give soldiers too much idle time is undoubtedly a mistake, but a reasonable number of hours to enjoy life in their own way is desirable.

LINES OF INFORMATION.

The telegraph and telephone service was apparently satisfactory; at least the Japanese officers frequently said so.

Communication on the field of battle was often conducted by the field telephone, which was also used to a considerable extent to communicate with the lesser headquarters when no battle was on. The more important work was conducted by telegraph. Visual signaling was not well perfected, or at least its use was very limited, and I saw no heliograph with the Japanese army.

CONCLUSIONS.

The acknowledged need for a healthy flow of promotion in our Army, and the desirability of having officers in the different grades with sufficient physical strength and activity to efficiently perform the duties pertaining to the same, require that some action be taken to eliminate the stagnation in promotion that now exists and is likely to increase. It is believed that these conditions can best be met by making a reasonable number of promotions to each grade by selection, and by retiring officers in the several grades at different ages. This course will stimulate exertion and ambition, and insure having officers with physical strength equal to the demands made upon them.

The combining of the supply departments, at least the Quartermaster and Subsistence departments, into one seems desirable. It is believed that such a change will be in the interests of simplicity and efficiency. The Ordnance Department is also a supply as well as a scientific department, but as the supplies furnished by it are in the main manufactured by the department, and not bought in open market, as is the case with the Quartermaster and Subsistence departments, it is not included in this recommendation.

As the duties pertaining to transportation are entirely distinct from the purchasing and issuing of supplies, it is suggested that a transport department be created, with separate sections under one head for railway, ocean, and field transportation.

The creation of a remount department and depots, susceptible of great and rapid expansion, is demanded both by economy and efficiency. As a part of this system, we should provide for depots at the rear in time of war where animals run down by sickness and hard work can be sent to recuper-

ate, just as we send sick men to a base-hospital for a like purpose.

It is believed that even a casual investigation will convince anyone that large military posts are better than small ones. They can be more economically conducted, and the instruction of the subordinate officers and men can be more satisfactorily given. They will also serve to give officers of higher grades practical experience in handling, in time of peace, commands commensurate with their rank.

The foregoing recommendation carried to its logical conclusion will do away with our geographical departments and divisions which can not, under any imaginable circumstances, be made to conform to war conditions. These geographical districts are the relics of our former difficulties with the Indians, and they have long outlived their usefulness. In the present day our department should be made to conform to the district in which a brigade is stationed, and our geographical division, as far as practicable, to the district containing a tactical division. In other words, I would replace the geographical department and division by the tactical brigade and division, respectively. Such a system would enable us to take the field with greater rapidity and with complete tactical organization, and also relieve the War Department on the outbreak of war of enormous labor in connection with the forming of brigades and divisions, including the selection of general and staff officers for the same, at least so far as regards the Regular Army.

In line with the suggestions made in the foregoing paragraph it is recommended that a list of general and staff officers to meet the needs of a volunteer army, so far as those officers are to be selected from the regular service, be made up and kept on file in the War Department, and revised from year to year as conditions seem to dictate. As far as practicable, these officers should be given some practice in time of peace in the duties for which they are selected for war service. Where this can not be done, it will be well to notify the officer that his name has been entered on the list for a particular duty, in order that he may by study properly inform himself. Officers selected from the regular service to command volunteer regiments could doubtless secure valuable

suggestions relating to the recruitment, organization, and instruction of such regiments from a careful perusal of the reports submitted by those officers who commanded regiments of United States Volunteers in our war with Spain and in the Philippine insurrection.

The need of a reserve for the purpose of changing our regular establishment from a peace to a war footing in the time of impending war, by the prompt addition of trained men, needs no argument. This important subject has already received careful consideration from the General Staff and a number of our senior officers, and has been presented to Congress by the War Department. The case might be met in several ways, and possibly the best, all circumstances considered, has been recommended. It might be well, however, to consider among the plans suggested the propriety of having all men, on enlistment, stipulate that in case hostilities occur before their discharge, in consequence of the expiration of three years' service, that they may be held for five or six instead of three years, and, further, that they may be subject to a call to the colors for war purposes at any time within two years or three years after the expiration of their three years' peace enlistment.^a Perhaps a small payment in the fourth, fifth, and sixth years would make this condition more acceptable to those who enlist.

This would take all honorably discharged soldiers, physically qualified, instead of the classes that were recommended by the General Staff, and, as a consequence, perhaps two years' service with the reserve would be sufficient to supply the number of men needed.

The formation of a reserve, and of depot battalions from which to draw trained recruits to replace losses occasioned by sickness or battle, is absolutely necessary to the proper prosecution of war.

It is thought that most officers will admit that our army suffers in time of peace from the lack of interest among the people. If this interest can be increased the army will be benefited thereby, and no better way to do this is known than to localize the recruiting districts for regiments and batteries. In a short time the people of these districts would undoubt-

^a The stipulation should also cover reasonable maneuver periods.

edly take a local pride in the record of any organization whose members were drawn from their respective communities. This would stimulate an esprit de corps in the organization and certainly discourage desertion. It would also encourage the conscientious soldier to inform the captain or the recruiting officer if such and such a man who might be seeking to enlist from the old soldier's home is desirable or undesirable. Within my own experience this has been done to the benefit of a company, and companies make the regiment.

The need for regimental organization for the field artillery is believed to be beyond question. Its utility was clearly demonstrated to my mind in Manchuria.

The rank assigned to subordinate army commanders in our service has always been less than is compatible with the importance of the position, and less than is given in other countries. When our officers are thrown with those from other nations they are almost invariably inferior in rank to others of the same age. If we unite with other countries in a common war, as we did recently in China, we may expect to see our officers subordinate in rank to those commanding a like number of men in the other armies. In the Japanese army a division was commanded by a lieutenant-general, and it is believed that public policy in our country would be better subserved by having one officer of that rank to at least each 30,000 men, instead of doing away with that grade.

Preparedness for war is a national duty, dictated by humanity, economy, patriotism, and national pride. In the present age such preparedness absolutely demands that a system be devised and accepted that will enable the country to pass from a peace to a war footing with the least possible expenditure of time and with the least practicable amount of friction and confusion. Perhaps there is no duty more important for military men in America than to try to impress upon their countrymen the fact that countries like Japan, which are prepared to pass in a day from a peace to a war footing, begin, on the declaration of war, to use their army, while we, at a like period, begin to organize ours.

APPENDIX.

PAY AND ALLOWANCES.

Pay of officers is spoken of as salary, of noncommissioned officers and soldiers as wages, and of the students in the different military schools as allowances. Officers are paid monthly; noncommissioned officers and soldiers every ten days.

Officers and special sergeant-majors in the active army receive, in addition to their pay proper, or, as it is frequently called, the "pay of the rank," the salary attached to the post or office to which the officer or the special sergeant-major is assigned.

Table showing the pay of the army.

YEARLY PAY.

Grade.	Rank pay.	Post pay.	Commuta- tion of quarters (monthly).
	<i>Yen.^a</i>	<i>Yen.</i>	<i>Yen.</i>
General	3,000	3,000	25.00
Lieutenant-general.....	2,000	2,000	18.75
Major-general.....	1,575	1,575	12.50
Colonel.....	1,116	1,236	10.00
Lieutenant-colonel.....	816	986	8.75
Major.....	516	708	7.50
Captain	300	^b 540 ^c 420	4.75
Lieutenant.....	228	^b 312 ^c 204	4.00
Sublieutenant.....	180	180	3.50
Special sergeant-major.....	144	^b 297.60 ^c 237.60 ^d 177.60	3.20

^a The Japanese yen is about equal to 50 cents, American gold. The yen contains 100 sen.

^b First class.

^c Second class.

^d Third class.

Monthly wages.

Grade.	Wages.	Commuta- tion of quarters.
	Yen.	Yen.
Sergeant-major	24.10 19.10 15.80 13.20 11.70	1.90
Sergeant	9.90 8.40 6.90 6.00	
Corporal	4.50 3.60	
Superior soldier	1.50	
First and second class soldiers.....	1.20	

* Vary according to post.

The commutation of quarters is only paid to sergeant-majors, sergeants, corporals, and soldiers when their duties do not require them to live in barracks, and under these circumstances they pay for their own food. Officers habitually reside outside of barracks and feed themselves.

Noncommissioned officers and superior soldiers who are able to speak a foreign language receive an increase of pay not to exceed 20 per cent.

In the case of the death of an officer his pay and allowances for the current month are given to his family.

In time of war officers serving in the field receive in addition to the total of their rank and post pay 40 per cent increase of the same, beginning on the date of departure from their proper station. Noncommissioned officers and soldiers receive 50 per cent increase in wages and in addition certain allowances are made to equip those not serving with the colors when war is declared.

ALLOWANCES.

An officer exercising a command higher than that called for by his commission receives 20 per cent of the salary of the higher grade in addition to the total pay that pertains properly to his own grade.

When an officer joins as a sublieutenant he receives the following allowances:

For purchase of uniform, 80 yen; and if he be a mounted officer, 120 yen for the purchase of a horse. After the first year he receives 24 yen annually to maintain and renew his mount. Mounted officers receive a monthly allowance of 8.75 yen for forage, and 43 sen, if in cavalry or field artillery, for horseshoeing, while other mounted officers receive 30 sen for the same purpose. Cavalry officers receive an annual allowance of 30 sen for horse brushes.

Report of Capt. William V. Judson, Corps of Engineers, Observer with the Russian Forces in Manchuria.

NOTE.—Captain Judson sailed from New York for the seat of war and arrived in St. Petersburg March 21, 1904. He left St. Petersburg on April 1, joined the Manchurian army in Liaoyang April 22, and remained with that army until August 6. On the latter date he left Liaoyang by rail for Vladivostok, reached Nikolsk August 12, and Vladivostok September 13. He returned to the Manchurian army October 15, and remained with it until the battle of Mukden.

On the occupation of Mukden by the Japanese on March 10, 1905, Captain Judson (with Colonel Havard, assistant surgeon-general, U. S. Army) was captured and sent to Japan, where he was released and allowed to return to the United States.

CHAPTER I.

ACCOUNT OF THE CAMPAIGN, INCLUDING DESCRIPTION OF RAILROAD, ETC.

We are never surprised, in reading history, when war begins. We see that it is the inevitable consequence of what has gone before.

The completion of the Siberian Railway and the acquisition of ports in Manchuria gave Russia tremendous advantages over Japan for the commercial exploitation of north-east China. It was not so much that the advance of Russia was threatening the territorial integrity of Japan, as that it was interposing a wedge between Japan and what she considered her legitimate prey. Japan struck when she did because of the Russian naval situation. Five or six battle ships were approaching completion in the Baltic. Russia was pursuing the policy of strengthening her eastern fleet as fast as ships came from the stocks. At the beginning of

1904 it was apparent to Japan that the time was slipping by when she could make war with the balance of advantages on her side. That she was ready to take the initiative, and that she did take it at this propitious moment, is evidence of the greatest military wisdom.

Speaking not of the Russians, but of ourselves, it has recently been said—

We are of sanguine temperament; we believe in our star; we regard the law lightly; * * * offenses are soon condoned, then forgotten, especially when public officials are offenders; evils must become oppressive to be eradicated; we are a military, but not a warlike people; that is, we have the temperament and intelligence of the best soldiers, but prefer peace to war.*

While I was with the Russians nothing impressed and surprised me more than to discover, as time went on, that here was a race more like our own than any other in all the world. The following extracts are from the Memoirs of Cassius M. Clay, who lived in Russia nearly nine years as our minister plenipotentiary, and who knew the Russians perfectly:

* * * these people, with no trace of western blood in their veins, are more like Americans than any of the European nations. * * * I do not hesitate to say that, of all the people I ever knew, the Russians are the most genial and hospitable. It is true the ranks in Russia are very distinct and marked; but the humane spirit of Russia thaws all coldness, breaks all conventional barriers, and fuses the whole into one national feeling, as in no other land. That is the reason that Russians never emigrate.

Circumstances have, indeed, given the Russians an entirely different political and industrial environment from our own. The law of self-preservation has compelled them thus far to retain autocracy. Military efficiency is almost impossible of attainment by a people of the Russian (or American) temperament under democratic institutions, and the position of Russia has demanded military efficiency.

The time appears to have arrived when the Russian people are no longer willing to sacrifice their ideals of political liberty and their hopes of industrial development under more liberal institutions to the maintenance of military strength,

* Democracy and our Army, by Lieut. Col. James S. Pettit, Eighth U. S. Infantry, Journal M. S. I., Jan.-Feb., 1906.

with its consequences of an assured national unity within Russian territorial possessions, and of an ultimate vast expansion, both in Europe and Asia.

The recent eagerness of Russia to lessen the importance of the armed strength of nations, through the extensions of the principle of arbitration, and through conventions designed to lessen the probability of war, may be readily understood if one admits that the Czar and his advisers have for some time anticipated the necessity for, or the advisability of, a relaxation from autocracy.

It is necessary to understand the Russian people and to appreciate the state of eager expectancy pervading all classes at the beginning of the war with Japan in order to see clearly many important influences that were at work in Russian councils before the war began; in the Manchurian army through its continuance; and in the mind of the Czar during the peace negotiations. Until the pains asserted themselves that were premonitory of the birth of popular government, Russia's territorial expansion was planned with great military sagacity; but of recent years, a new element has been introduced. Expansion must, first of all, be made popular. Consequently, Russia's unfortunate expansion to the Yalu and the Yellow Sea was a strictly political and commercial enterprise, involving dangers which her professional soldiers understood and pointed out. The special military preparations that could alone have neutralized the dangers incident to this policy were, in large part, lacking. The military efficiency of the great Siberian railroad was sacrificed to the building of the magnificent commercial cities of Harbin and Dalny, and innumerable well-built towns in Siberia and Manchuria. Insufficient funds were provided for the fortifications at Port Arthur, and a great undefended port, with every facility for the handling and storage of supplies and the unloading of troops, was created at Dalny to serve any enemy as an ideal base of operations. Sidings on the Trans-Siberian Railroad were so far apart that when war began troops could be transported only at the rate of, say, 30,000 men per month.

A few months prior to the outbreak of war the Russian land forces in the Far East included one brigade of the Tenth

and one brigade of the Seventeenth European Corps, which had been brought from Russia during the Boxer troubles of 1900, and nine brigades of East Siberian Rifles. Each European brigade included two regiments of four battalions each, and the two brigades aggregated about 9,000 infantry. The nine brigades of Siberian Rifles—organized in regiments of two battalions each; four regiments to the brigade—aggregated about 43,000.

Of field and mountain artillery there was in the Far East at this period approximately 166 guns, of cavalry about 3,000 sabers, and of sappers, including pontonniers and telegraph companies, about 2,000 men. The above estimate does not include garrison artillery, special and technical troops at Vladivostok and Port Arthur, about 20,000 railway guards required for guarding the line of communications in Manchuria, nor the railway troops engaged in the operation of the railway. Thus it is seen that the total Russian force available for field operations was approximately:

Regiments	52,000
Guns	166
Sabers	5,000
Sappers, etc.	2,000

Of these troops about one-half were quartered near Port Arthur and Vladivostok, and in case of war would be required for the land defenses of these fortresses.

It is really apparent that Russia was in no situation successfully to oppose Japan on the land if war should break out suddenly. This was perfectly apparent to the Russian military authorities. But it was the opinion of the Russian foreign office that war could be averted through diplomatic negotiations, and the foreign office believed that any active steps to strengthen their forces in the East would precipitate a war.

At this period, as is well understood, Russia was under agreement to evacuate Manchuria under certain conditions, during the eighteen months following April 8, 1902. But the conditions precedent to evacuation did not exist at the outbreak of the present war.

A few words upon the character of the Russian occupation of Manchuria may be of interest. The Boxer troubles of

1900 had been especially serious in Manchuria. The railroad from Harbin nearly to Port Arthur had been seized, and guards and working parties had been dispersed, in many cases suffering great losses. The campaign for the recovery of the railroad was a serious one, and for its prosecution all the troops that have been mentioned above were required and many others that were subsequently demobilized. After the Boxer war large numbers of Chinese, more or less regularly organized and well armed and mounted, continued to infest the valley of the Liao River, threatening the railroad at many points. Ignoring the diplomatic situation entirely, it is fair to say that the Russian forces east of Lake Baikal were not unreasonably large to garrison the Pri-Amurski region and Kuangtung Peninsula, and to assist the railway guards in protecting the Chinese Eastern Railroad.

In no sense had the government of Manchuria been usurped by the Russians. Chinese governmental functions are practically limited to the administration of alleged justice and the collection of taxes, and these functions China continued to exercise both before and during the present war. In no way did the Russians interfere with the domestic or foreign commerce of Manchuria beyond facilitating both by the construction of her railway. The Chinese of Manchuria were very well content to have the Russians with them. Their presence insured greater tranquility and they expended locally large sums of money, which is the surest way to please a Chinaman. It may be as well at this point to say that subsequently, during the war, the Russians treated the Chinese in the fairest possible manner. It was an anomalous situation, the waging of a great war in a neutral country. At the hands of the Russians the Chinese fared about as the farmers do at our maneuvers. If an organization camped in a millet field before moving on, compensation was given for all damage done to the crops. Before the battle of Liaoyang the Russians paid for the kaoliang that had to be cut down in front of their fieldworks. Before the battle of Mukden the Russians were preparing to distribute seed grain to all applicants. Of course, all of this was "policy." But the result was that the people of Manchuria will remember the halcyon days of the Russian occupation, as will the citizens of St. Louis the period of their World's Fair.

As the question of transportation plays so large a part of the present war, it is well to consider the resources of the region in and near the theater of war. Siberia, east of Lake Baikal, is divided for purposes of government into the Transbaikal, Amur, Primorski, Yakutsk, and Sakhalin districts. In 1897 the population of this region was nearly 1,500,000. In 1904 it probably approached 2,000,000. While the total area is nearly 3,000,000 square miles, the land which may be profitably cultivated is remarkably little. The Amur district is a mining country. Transbaikalia is in large part a dry, sandy, treeless country, fit only for the grazing of cattle. In the Primorsk district the hopes that have been entertained of a great wheat production have not been realized. Immigrants have been returning thence to their homes in Russia. There is some farming, but mining, fishing, and lumbering are important occupations. I have not, perhaps, gathered all available statistics, but it appears to be true that the region east of Baikal must derive from outside sources a part of its grain supply, most other foodstuffs except fish and meat, and all manufactured articles, such as clothing and household goods. Ordinarily these demands have been supplied through Vladivostok, but for a great portion of the time during the present war the Japanese have succeeded in closing that port, thus throwing upon the Trans-Siberian Railway a service it is not ordinarily required to render.

The population of Manchuria is about 18,000,000, and is almost wholly agricultural, in ordinary years sending abroad great quantities of food and forage stuffs. For example, in 1901 there was exported from Newchwang alone about 450,000 tons of beans, bean cake, etc.

If the closing of Vladivostok was a loss to the Russians, the closing of the Manchuria ports operated in one way to their advantage, bottling up in Manchuria much food and forage that they were in great need of.

Moreover, in Manchuria there exists an indefinite supply of inferior horses, and all the Chinese carts and pack equipment that any army might wish to use.

Mongolia, lying just west of Manchuria, produces large quantities of cattle, sheep, and horses.

The demands upon the railroad have, then, been as follows:

(1) The requirements of a civil population of about 2,000,000, except as to meat and fish, but including some grain stuffs.

(2) The transportation to the front of troops with equipment and trains, the latter reduced to a minimum as regards horses and wagon transportation.

(3) The transportation of the sick and wounded from the front to reserve hospitals, and of medical supplies from Russia.

(4) Food supplies for the army, from west of Lake Baikal, excepting meat, but including some rye flour.

(5) Ammunition, engineer material, and clothing.

(6) Remounts for the artillery, the officers, and a part of the cavalry.

(7) The shifting of food and forage products from north and central Manchuria to the front.

(8) The local shifting of troops near the front.

(9) The hauling of fuel for railroad use, and, during winter, for the army as well.

(10) Construction and repair trains.

(11) Miscellaneous, including special trains for grand dukes and officers of high rank, the transportation of guns and naval material and supplies, first to Port Arthur and later to Vladivostok, etc.

All construction and repair work, the operation of the railroad west of Manchuria, and larger items of construction work in Manchuria, such as the Khingan tunnel, were under the administration of Prince Khilkoff, the minister of communications. Construction and repair work in Manchuria and also the operation of the road there, were under General Horwat, who commanded the railway troops. But the general of communications upon the staff of General Kuropatkin, and the corresponding officials of the general staff at Petersburg, controlled the traffic.

For the civil population and for the sutlers at the front, cars were allotted to meet all reasonable demands, orders for cars ordinarily being given to the merchants making the original shipments. On account of the high prices prevailing in the Far East, there arose a traffic in these transportation orders that at times constituted a great abuse.

A specified number of trains a day were allotted to the intendant for food, forage, clothing, etc.

The chief of artillery, the chief engineer, and the chief sanitary officer, or the corresponding officials at St. Petersburg received allotments of cars or trains, as required. It can not be denied that the control of traffic was exercised with the least possible confusion, facilitating operation in every way.

In April, 1904, the maximum distance between sidings was about 30 versts, but the distance ordinarily encountered was 18 to 20 versts. The average number of trains per day in each direction, not counting working trains, was about four. The work of building intermediate sidings and increasing the switching and storage facilities at important stations was energetically prosecuted. The maximum distance between sidings was finally reduced to about 10 versts. The road around Lake Baikal was completed, although the steamers continued to be used to save much of the traffic the long detour. While the ice was still strong in the spring of 1904, a temporary track was laid across the ice, and several hundred locomotives and several thousand cars (the former had to be taken apart) were transported to the eastern side. No attempt was made to run loaded trains across on the ice. The Kinghan section of the road, including a tunnel 3,115 yards long at the summit, was completed. Water supply was attended to. New shops were equipped. The supply of rolling stock and motive power was ample. The bridges were of the latest types and the roadbed was in good condition. As a general rule the grades were very slight except for comparatively short sections in the Urals, the Altai, and Kinghan mountains. The personnel was sufficient and well trained and disciplined. Serious accidents were almost unknown. The personnel of the railway troops in Manchuria consisted of one brigade (four battalions, six companies each, 300 to 400 men to each company) of railway troops. Many civilians were employed as well. In the case of the locomotive engineers, etc., the military feature of their employment was little more than nominal. The ordinary discipline for such men was as it would be in civil life in the same pursuit. They receive, of course, remarkably small

pay, but on the other hand, where nearly every man is liable to military service, these men have the advantage of serving their time in their usual employment, and under conditions to which they are accustomed.

By August 1, 1904, it was possible under favorable conditions to operate 11 trains and by January 1, 1905, 14 trains in each direction daily. The favorable conditions of course ceased when the wounded must be transported to the rear during and after a battle, and frequently ceased also due to accidental causes. Other things being equal, the probability of accidental delay must vary with the length of a line. If it were not for this very obvious law the number of trains that might be delivered at the end of a line in a given time would be independent of its length.

It is obvious that the capacity of the railroad could not be made to increase indefinitely. To put in sidings intermediate to those now existing was a work that was impossible of accomplishment during this war. After January 1, 1905, the capacity of the railway remained constant.

There was nothing remarkable about the terminal facilities of Harbin or Mukden proper. The former city had within its limits about 6 miles of main line, 25 miles of sidings, and almost no platforms or other unloading facilities. At Mukden proper there were about 7 miles of sidings and 800 linear feet of platform. The sidings at both Harbin and Mukden were for the most part parallel to main line and connected thereto at each end. The unloading of horses was accomplished by means of light portable ramps. The operation of unloading trains was accomplished quickly, using many men, but there was little to be learned from the methods pursued, except perhaps that elaborate preparations for such operations are not at all indispensable.

The open flat cars used by the Russians were 9 feet wide and 34 feet long. Each would carry 12 1-horse carts, or 6 2-horse wagons, or 2 ponton wagons, loaded, or 2 guns and a limber. The box cars were 9 feet wide, 21 feet long, and 7 feet 6 inches high, inside measurement, with sliding doors 6 feet 1 inch wide and of the height of the car body. They carried 8 horses, 4 in each end, with their heads toward the door; or 40 men on two platforms raised, respectively, 16

inches and 52 inches above the floor and covering it, except between the doors. The floors or platforms of all cars were 4 feet above the base of the rails. The rails about Mukden were 4.4 inches wide at the base, 2.4 inches wide at the top, and 4.8 inches high over all. As a rule, on the Trans-Siberian Railway rails were in use varying in weight from 55 to 66 pounds per yard. The ties were closely spaced, of round stuff usually, faced on top. Seventy-five per cent of the road was ballasted. The gauge was 5 feet.

To guard the railway the Russians maintained from the beginning to the end of the war 4 brigades of selected troops, 25,000 men, organized as 64 companies of infantry, 65 squadrons of cavalry or mounted infantry, and 10 batteries of artillery. Many of these, especially the mounted men, were at various times attached to the field army. As a rule, they were scattered along the whole line in Manchuria, south, east, and west of Harbin, where was their headquarters. Every important bridge was defended by trenches. And near each bridge across a main river large barges were maintained for service as ferries in case the bridge should be destroyed. The main posts for railway guard duty were at the larger stations, and there were minor posts at intervals no greater than 3 miles, from which patrols of two or three men were sent in each direction until they met patrols from adjacent posts.

From the main posts mounted patrols were continually scouring the country for a distance of at least 20 miles on each side of the railway.

Between the Ural Mountains and the Manchurian frontier 55,000 troops were engaged in guarding the railway.

To show that these precautions were not unnecessary, it may be remarked that in a single month there were reported ninety attempts to injure the railway between Mukden and a point 75 miles further north.

During the winter of 1904-5 a number of short branches from the main line were constructed, and many light military lines were placed for the convenient supply of troops along the fortified line of the Sha River.

At the time the battle of Mukden began the average daily traffic of the railroad near the front was somewhat as follows:

Number of trains allotted to Intendant.....	6
Sanitary	1
Railroad purposes.....	1
Ammunition and miscellaneous military.....	1
Regular mail train, with cars for officers and civilians, and cars allotted for sutlers, civil demands, etc.....	1
Leaving, for troops.....	2+
<hr/>	
Average number of trains arriving per day, say.....	12+

When it is noted that 120 trains were required for the transportation of a single army corps, it will be readily seen that the ordinary wear and tear of the campaign upon the personnel could barely be repaired at this period. In other words, just before the battle of Mukden the Russian armies were nearly as strong as they ever could be expected to become.

I have attempted to describe hastily the weakest link in the chain of Russian land defense, to wit, their line of communications. It is now proposed to review hastily the military operations preceding the decisive battle of Mukden.

Troops arriving from Russia prior to the evacuation of Liaoyang, were generally debarked at that place, and supplies of all kinds were accumulated there for use in the earlier operations.

Prior to the battle of Liaoyang the Russians were opposing the converging movements of Oku, Kuroki, and Nodzu. I believe that during all this period it was anticipated by General Kuropatkin that a retrograde movement from Liaoyang would eventually be necessary. On May 6, 1904, I heard the General remark facetiously that he would advise no one to buy a house in Liaoyang, nor yet in Mukden. It was his plan, as is well understood, to fall back as slowly as possible, covering the rail head, until his army, concentrated as far to the south as the Japanese would permit, should possess numbers sufficient to insure success. There were doubtless moments during the fighting at Liaoyang when Kuropatkin hoped for better things. But the removal of supplies and material from Liaoyang began long before the battle commenced. The battle was fought by the Russians under the

and plenty of rolling stock, was laid almost extravagantly. Provision, forage, ammunition, and fuel depots were established in rear of many points of the line. To illustrate the profusion of supply it may be mentioned that by the end of January the chief intendant reported in the central depots alone over 70,000 tons of grain, 30,000 tons of flour and bread, 8,000 tons of frozen meat, and 29,000 beeves on the hoof. At the same time the reserve hospitals from Harbin south reported 24,000 vacant beds. In addition to the 10 or 12 perfectly appointed hospital trains, each with about 20 cars and accommodating nearly 300 patients, 600 box cars were fitted up with stoves, mattresses, and blankets, and were retained convenient to the front.

Light portable ramps or bridges were constructed of bamboo poles and rope netting, and the troops were drilled assiduously in methods of attack, including the passage of obstacles by means of these ramps.

January 5 there began the most extensive cavalry raid undertaken by the Russians. It was directed against the left rear of the Japanese. Weather and roads were favorable and ample food and forage were obtainable along the route, but the movement was very slow. Transport was by pack animals led by dismounted men. The force comprised 72 squadrons, 23 guns (horse artillery), and 4 machine guns. The advance was in 3 columns—the left, between the Hun and Liao rivers, near the latter, was commanded by General Tyellschöff; the center, directly under Mistchenko, marched down the east bank of the Liao; the right, under Samsonoff, followed the west bank of the Liao. But few considerable bodies of the enemy were encountered. On January 10 a band of Hunhuzes, carrying a Japanese flag, was dispersed, losing about 50 killed, the Dhagestan Regiment of Caucasian Cossacks charging the Hunhuzes with the saber. On the same day the central column encountered 500 Japanese near the junction of the Hun and Liao. A Cossack regiment attacked on foot, and the Japanese were finally driven away after inflicting serious loss on the Russians. On January 11 old Newchwang was taken. Fifty Japs in a strong compound defended themselves so strenuously that the Russians departed without taking them. On January 13, in the afternoon, the Russians attacked the railroad station at Yingkou

(Newchwang Port). The greater part of the force remained in reserve. One brigade took position to the eastward to cover the operation against Japanese coming from Tashih-chao. Before the dispositions were completed a train arrived at the railway station from the eastward conveying 600 infantry. This force, with 300 soldiers and civilians from Yingkou, occupying intrenchments, repulsed the Russian attack at about dusk. The Japanese had no artillery, and the Russians could doubtless have accomplished more if they had seriously tried. Withdrawing north on the evening of January 13, Mistchenko crossed the Liao from the east to west about 40 miles above Yinkou, and on January 16 arrived back near Ssufangtai, whence he had started. While the main columns were moving as above recounted, small detachments, moving eastward broke the railroad in several places. No bridges were destroyed, and repairs were quickly made by the Japanese. On the whole, the Japanese seem to have suffered very little loss or inconvenience from the raid. On the other hand, it may well be held that the movement of troops to their left rear, induced by the raid, placed the Japanese in a more favorable situation when the Russian advance began later in the month.

Toward the end of January General Kuropatkin again took the offensive. For several weeks the weather had been ideal, the thermometer varying quite uniformly each day from a minimum of 12° F. to a maximum of 34°. The days were cloudless; there was no snow; streams and ground were frozen, and in the plain there was nothing to obstruct the movement of troops. With reference to the movement which was about to begin, it is interesting to remark that among my notes is a clipping from the London Morning Post of a telegram dated Paris, January 18, 1905, in which the plans of the Russians are fully and accurately described about a week before they were set in execution. Correspondents with the Russians never had trouble evading the censor. A Chinaman could always be employed for 2 or 3 rubles to deliver telegrams or mail at Hsinmintun, or some station on the railroad near thereto. At least three correspondents, and two of them certainly without permission from the Russians, actually left the Russian forces entirely, visiting Tientsin, and

then returning to Mukden. One of these correspondents sent out either from Newchwang or Tientsin dispatches conveying the impression that the Russian officers were principally engaged in riotous living, consorting with harlots, etc. Now it was my own observation that as regards liquor the Russian officer at the front was rather abstemious than otherwise. At Liaoyang there may have been 50 European and American prostitutes, but at Mukden, during the winter of 1904-5, there were none. I have the figures for several months, showing that the venereal cases in the Russian army varied between 1.6 and 2.7 per thousand.

For reasons such as I have given I am convinced that we should in war follow the Japanese rather than the Russian procedure in dealing with correspondents. Even the Japanese, under pressure, allowed greater liberties to press representatives than they judged wise. In my opinion the only safe way to deal with this question is to give out information through some official channel, at the capital of the country, on a sufficiently liberal scale to satiate public curiosity. Nevertheless it is probable that any determination to prevent correspondents from accompanying the field army would be so unpopular as to be impracticable. Military attachés are less dangerous only than war correspondents. Many of them will be ill disposed for one reason or another. Some will try to "make records" in getting out information, and some may even try covertly to furnish information to the press.

The Russian advance began on the 24th of January, 1905, under the auspicious circumstances hitherto described. The Russians numbered about 325,000 infantry, 22,000 cavalry, 13,000 engineers, and 28,000 artillery—a total of 390,000 men, with 1,458 guns.

The Russian estimate of Japanese strength at this date was 250,000 men and 900 guns. It can not be doubted that the Russians were reasonably confident of success.

General Gripenberg, with 100,000 infantry, 70 squadrons of cavalry, and 400 guns, advanced against the Japanese left, the Russian right endeavoring to execute a turning movement. In the Russian center, on both sides of the railroad, were massed about 200 siege and as many more field guns, which opened fire, not too energetically, when Gripenberg's

movement began. Kaulbars in the center was to support Grippenbergh at the proper time, and Linevitch on the left was to advance if the Japanese withdrew. As regards Linevitch and Kaulbars, the ensuing battle was confined to minor demonstrations and a general bombardment. Grippenbergh's right progressed favorably for two days, taking a number of villages but always encountering more resistance as it advanced eastward, and finally retiring, it is said, because of the check of the troops on their left. Grippenbergh's center and left never moved more than a few miles. The Japanese had prepared for defense the village of Chentanpu, trenches and a redoubt adding to the strength of the place. The Russians were held so long at Chentanpu that the Japanese were enabled largely to reenforce this part of the line.

Meantime, it is necessary to advert to weather conditions. The day the movement began the thermometer dropped to 0° F. and the next day to 12° below zero, and for nearly a week a blizzard prevailed.

As the Russians were attacking fortified villages a preparatory artillery fire was a necessity, and the snow was so thick for much of the time that the batteries could not stay out of infantry range and still see their targets. The wounded, weakened with loss of blood, perished from cold in great numbers. It was also discovered that the rapid fire of the guns on the unyielding platform afforded by the frozen soil produced injurious strains in the wheels and in parts of the carriages. This circumstance indicates that there should be had tests of our own field guns upon unyielding platforms. Finally, bivouacing in the fierce wind and snow, with the thermometer far below zero, speedily exhausted the vitality of the troops. The Russian had honestly expected much from a winter campaign, but he was "hoist with his own petard."

On January 28 General Kuropatkin ordered Grippenbergh to withdraw. The Japanese, who had been fiercely but without success attacking Heikoutai, the center of defense of Grippenbergh's right, entered the village under the impression that the Russians had been expelled by their direct attacks. Grippenbergh contended that the movement should be continued, supported by additional troops, or by a general

advance along the whole line. Indeed, Grippenbergr refused to issue the detailed order for retirement, and Kuropatkin was compelled to issue the same from his own headquarters. Notwithstanding a noble and patriotic appeal from Kuropatkin addressed not as to a military inferior, but as from one brother to another, Grippenbergr left the army and returned to Petersburg. Other animosities arose during or as a result of the Chentanpu battle. General Stackelberg, commanding the First Siberian Corps, quarreled with General Myloff commanding the Eighth Corps. Subordinates took up the quarrels of their immediate commanders. Grippenbergr was accused of deserting a sinking ship. An anti-Kuropatkin feeling, not very widespread but very intense, was now in considerable evidence. It became the prevailing impression that the Russians could never make headway southward from the line of the Sha River. Officers on duty in the trenches would ask as to the prospects of peace. The private soldiers began accusing their officers of betraying them. The morale of the Russians was at a low ebb.

Accounting for the unsuccessful movement of Grippenbergr, General Kuropatkin remarked afterwards that no connection had been maintained between the troops, that the corps commanders had not cooperated, that the artillery wasted its ammunition, and that the cold militated against success.

The peculiar distribution of a large part of the artillery of Grippenbergr's army is worthy of note. In many cases batteries were attached singly to regiments of infantry. Whether this was Grippenbergr's idea of correct practice, or whether it was due to weather conditions, I do not know, but it illustrates the tendency displayed by the Russians to scatter their guns and the fire of their guns as well. It is said that at this time General Kuropatkin, comparing Japanese with Russian tactics, pronounced the former far superior, but regarded it as impracticable to adopt such tactics successfully before the end of the war. In order to illustrate the principal defect of Russian tactics to which he alluded I may be permitted to exaggerate a trifle. A corps commander charged with the execution of some particular offensive movement would remain far in the rear with one division,

assigning the command at the front to the commander of the other division. The latter would advance some distance and then throw one brigade forward. Thereupon the brigade commander at the front would push out one regiment to make the attack, and this regiment would of course be formed in the usual manner in three lines. Thus the Russian formation for attack was of enormous depth, without sufficient numbers in contact with the enemy. Too great proportions of infantry were kept in reserve, and far too great proportions of artillery. The senior German attaché wisely remarked that the true reserves for the artillery are the ammunition columns.

Following the battle of Chentanpu was a period regarded by General Kuropatkin as a mere interlude in his offensive operations. He was waiting now only for proper conditions of weather and season. During this short period there was no growth of the army at the front, but probably a reduction. About 12,000 were lost in the operations of Grippenbergh, although it is probable that these losses were quickly replaced from the reservists retained in rear of the army.

A number of small organizations selected from among the Siberian Rifle regiments were sent to the Vladivostok region to form nuclei for the reorganization of the Fourth and Seventh Siberian Rifle divisions lost at Port Arthur. A part of the Sixteenth Corps and some cavalry were sent up the railroad, as a large Chinese force under Japanese leadership was reported to be advancing eastward on Kungehulin from Mongolia. There was every reason to believe that the army could not be much further increased in numbers. New organizations might arrive, but losses in old organizations would substantially balance their numbers. By the middle of February, indeed, the Fourth Rifle Corps was reported to be arriving at Harbin, and during the battle of Mukden at least a part of the Third Brigade of Rifles arrived at the front. I do not know whether there was truth in what we heard, that the Fourth Corps was diverted to Vladivostok.

Meantime the Russians remained ready to advance by their right flank, Kaulbars having replaced Grippenbergh in command of the Second Army.

Now, early in March it was to be expected that the ice would break up. Spring comes on suddenly in Manchuria. Evidently both Kuropatkin and Oyama determined to take the initiative at the very end of winter, when the streams might be expected to remain frozen during the inevitable battle, but when warmer weather would quickly bring relief from the hardships of the winter bivouac.

On the 20th of February the Russian forces were distributed approximately as follows, from right to left: The greater part of the cavalry, under General Rennencamp, between Ssufangtai and the Liao; near Ssufangtai, the Rifle Corps; on the right rear of the Rifles rested the First Siberian Rifle Corps; vicinity of Changtan, the Eighth Corps; vicinity of Kuchiatzu, the Tenth Corps—the corps hitherto mentioned constituting the Second Army, under command of General Kaulbars; vicinity of Sanchiatzu, the Fifth Corps; across the railroad just north of the Sha, the Seventeenth Corps; vicinity of Putilov Hill, the Sixth Corps—the three corps last mentioned constituting the Third Army, under General Baron Binderling; Liuchiangtun to Tashan Hill, the First (Russian) Corps; Tashan Hill-Liushihtaitzu, the Fourth Siberian Corps; in the hills north of the Sha, between Liushihtaitzu and Pienniulupu, the Second Siberian Rifle Corps; Pienniulupu-Kaotuling, the Third Siberian Rifle Corps; covering the passes southeast of Mukden, vicinity of Chinghochon and Chintoukou, the Eastern Detachment; connecting the Third Corps and the Eastern Detachment, Samsonoff's division of cavalry—all troops east of Liuchiangtun constituting the First Army, commanded by General Linévitch. The Sixteenth Corps, near Wanshitun, 3 miles southeast of the railroad bridge across the Hun, constituted the general reserve.

Of the Japanese dispositions at this time I am naturally less certain, but from information derived from Russian sources, and from conversations with Japanese officers at Marshal Oyama's headquarters, and on the transport en route to Japan, I gather that they were about as follows, from left to right: Between the Liao and the railroad, fronting the Second Russian Army, the Third, Eighth, and Fifth divisions of Oku; behind Oku's left, the First, Seventh, and

Ninth divisions, 1 brigade of the Fifteenth Reserve Division, and the mobile force of Akiyama, consisting of 1 division of cavalry, 1 regiment of infantry, and 3 regiments of artillery, all under Nogi; on Oku's right, facing the Third and the right of the First Russian Army, the Second, Fourth, and Sixth divisions of Nodzu; prolonging the Japanese line to the eastward, the Guards, Twelfth and Tenth divisions of Kuroki; near Hsienchang, the Eleventh Division and two and one-half reserve divisions commanded by Kawamura.

It must be said in advance that no accurate and detailed account of the battle of Mukden can be written until the official reports of subordinate commanders on both sides are available for study.

General Kuropatkin's orders were issued for an advance to begin on February 24. At this time the Russian forces at the front may be estimated at 370,000 men, with nearly 1,500 guns. I believe Kuropatkin estimated the Japanese at about 340,000, allowing for the arrival of Nogi. There is much negative evidence that he was unaware of the approach of Kawamura with three and one-half divisions from the Yalu by way of Fenghuangcheng. In all probability the Japanese outnumbered the Russians by at least 30,000 men.

On February 22 Kawamura struck the so-called eastern detachment, holding the passes about 50 miles southeast of Mukden. This force was commanded ordinarily by Rennenkampf, but that able general had been moved over to command the cavalry on the right flank during the proposed advance, and General Alexieff, with about 30,000 infantry, 3,000 cavalry, and perhaps 32 guns, received the attack. His front was in part intrenched, but the vastly superior numbers of the Japanese enabled them to envelope both flanks and force the Russians from their works. The Japanese did not lose contact, but steadily forced the Russians back till March 1, when the latter took up a strong position in front of Machuntun and Tita, with their right flank in touch with the Third Corps near Kaotuling Pass, and their left near the Hun; this position they hastily fortified, and they were never driven out of it, but inflicted such losses on Kawamura during the following week as to ruin, I believe,

the efficiency of the army. Meantime Alexieff was relieved in disgrace, and Rennenkampf was brought back to his old command. The First Siberian Corps was sent over from the right flank, and other reenforcements from the Fourth and Third Corps were brought up, but the First Siberian Corps was never required and was soon sent to another part of the field.

During the last days of February, when the attention of the Russians was concentrated upon their left flank, Nogi's army was rapidly advancing up the Liao, the Russian cavalry retiring before it.

The extreme Japanese left was covered by General Akiyama with a mixed force consisting of a division of cavalry, about 5,000 infantry, made especially mobile by means of excess transportation, and three regiments of field artillery. The composition of this force, if I am correctly informed, is very interesting, as it was designed to cope with nearly 10,000 Russian cavalry with about 40 guns.

Simultaneously with Nogi's movement, Oku, reinforcing his left, was swinging it forward, maintaining touch with Nogi. With such forces on its flank and rear the Rifle Corps fell back from its works and faced westward, on a line extending north from Changtan.

On March 1 Akiyama occupied Hsinmintun, and on the same day the Japanese assaulted repeatedly the fortified town of Changtan. They could not take it, but during the night it was evacuated by order of General Kuropatkin, who must make new dispositions to protect his threatened right.

The First Siberian Corps was started back from the vicinity of Machuntun. The Sixteenth Corps was sent toward Hsinmintun. The Rifles, Eighth and Tenth Corps took position north of the Hun, on a north and south line covering Mukden. The Fifth and the right of the Seventeenth Corps, out of their works, with detachments from corps west of Mukden, connected the Hun with that part of the fortified line of the Sha River which was still occupied. Such was the situation on the Russian right on the night of March 2.

Meanwhile Oku and Nodzu had been gaining ground to their left as well as forward. There was fierce fighting from west around to south of Mukden. On the 4th of March it

was reported that the Sixteenth Corps had struck Nogi near the Hsimintun road and had been very badly shaken up. Nogi's movement had begun with great rapidity, he having made 30 miles the first day. His advance was checked for some time by the Sixteenth Corps, and the Russians were enabled to form the First Siberian Corps facing southwestward on the 6th, with a fair prospect of crushing Oku's left. The troops of the First Siberian fought with their usual desperation, incurring frightful losses. They took the village of Tashihchiao, on the Hsimintun road, but Nogi came up in time to strike their flank in turn and they were driven back toward Mukden.

From a point a mile north of the Hsimintun road stretching down to the Hun, the Russians had a well-fortified line parallel to the railroad and about $3\frac{1}{2}$ miles from it. They were never pressed from these works, and generally possessed the villages lying in advance of them. For a week before the end the battle west of Mukden was a struggle for these villages, some of which changed hands many times, and some of which were occupied for days together by both sides. In the angle between the Hun and the railroad the Russians presented an awkward salient for several days following March 1, but they held on here for the purpose of removing their siege guns. When this had been in large part accomplished they fell back on the 5th, badly punished, to the line Machiapu-Putilov Hill.

It is desirable to review the situation as it existed on the morning of March 7. Beginning at the Russian left, Kawamura had apparently been fought to a standstill. Kuroki's assaults upon the Second and Third Corps had been uniformly repulsed, the Guards Division on Kuroki's left had been almost annihilated. The Fourth, First Rifles, and Sixth Corps had been continuously attacked in their works, but had defended the same with comparative ease, although furnishing large reinforcements to other parts of the line. The army of Linevitch was ready for anything. Its morale was higher than when the battle began. If the attacks against the First Army were in the nature of mere demonstrations, the Japanese do not attach the ordinary meaning to that word. It is hardly to be doubted that the two armies on the

Japanese right and the right wing of Nodzu as well were nearly "all out."

At this same period Oku and the left of Nodzu were doing little more than to hold their own. The real danger to the Russians was, of course, from Nogi. He was gradually swinging his divisions in north of the Hsimintun road, pivoting upon his right. This compelled the Russians continually to extend northward, parallel to the railroad, and something must be done to obtain the troops for such an extension.

On the afternoon of the 7th the entire center and left was ordered back to the strongly fortified line of the Hun, a much shorter line than that previously occupied. Only the Sixth and a part of the First Rifles Corps were left south of the river, in a very strong *tete de pont*, consisting of five forts very similar to those in front of Liaoyang, with intermediate redoubts and trenches, and emplacements prepared for 200 guns. The accomplishment of this movement during the night of March 7 released what was left of two corps, and numerous detachments from others, for use upon the extreme right. It is said that the retrograde movement brought tears to the eyes of many of the First Army. Their successes had aroused the hope that they would be moved forward. It was the opinion of many that this concentration about Mukden might well have occurred at an earlier date, but even as it was it promised to insure the safety of the right, and during the 8th of March, with troops being poured into the northwest sector, it appeared that the day (or shall we have to modify the expression and say the fortnight?) was not yet lost. There must be some end to Japanese endurance, and it was felt that that end must be approaching.

On the 9th of March there prevailed about Mukden a dust storm of a severity far beyond the recollection of a missionary who had been twenty years in the country. In nearly a year's experience of Manchuria I had seen many dust storms, but none remotely approaching this one. In riding westward near the railway station, a single companion and I had the greatest difficulty to avoid separation. Within 200 feet of the station we were practically lost. Eyes and nostrils filled with fine sand; one was unable to see 20 feet in any

direction. No man can tell the story of this day from what he saw. He can not always tell what he did.

On the afternoon of this day I found the temporary residence in Mukden of the four or five senior attachés, who remained nominally at headquarters of the grand army. Here I was assured by a friend, a Russian officer attached to headquarters, that the situation was unchanged—that there could be no possible thought of retreat.

Since November I had been attached to the Fourth Corps. During the early days of the battle of Mukden I had been with that corps near the center of the Russian line, but on March 3 I proceeded to the west of Mukden, spending the following nights in the house of some war correspondents, just south of Mukden, and the days west of the railway. On the night of March 9, until a late hour, we were engaged in observing a bombardment of the forts of the *tête de pont*. At about 11 p. m. I received a personal note from a Russian friend who was with the several officers attached to headquarters, stating that they proposed to start northward early the next morning. No communications were received, I believe, by any of the other officers or correspondents at our resting place. The attachés at headquarters often left at an early stage of the proceedings and no particular importance was attached to their proposed departure. To the best of my belief the corps to which I was attached was south and east of Mukden. Major Macomb, who was attached to the Seventeenth Corps, then, I believe, marching northward, determined to leave; but the rest of us, four correspondents, a British attaché, Colonel Havard, and myself, determined, for the moment, to remain. I had had a slight attack of the "grip" accompanied by intestinal disorders for a few days, and probably Colonel Havard, not knowing whether it was best to go with Macomb or stay with me, was influenced by this circumstance. But I do not attribute my capture entirely to illness, as I think I could have made the ride northward had it seemed necessary at the time. From all information we possessed it appeared that there would be fighting at Mukden for several days longer; that in the end the Japanese might exhaust their attacks, or, if not, that a part or all of the Russian army might be shut up in Mukden. I had been re-

fused permission to enter Port Arthur, and I had been told that no attaché could again enter Vladivostok. There was so large a probability that the last important military operations of the war were being enacted, and there was so large a chance of a Plevna or a Metz developing, that, as an engineer officer, with special instructions to report on siege operations. I felt bound to stay, and I arrived at this conclusion the more readily as the separation of Macomb and myself placed us in a situation to see whatever might occur. I sent my baggage cart and spare horse northward with my Russian soldier orderly, and proposed to await further events with my Indian servant, two horses, and our saddlebags. At daybreak on the 10th of March we were aroused by the noise of an infantry combat in our immediate vicinity. Before we could get out of our compound we discovered that the Japanese were in our midst, picking off stragglers from the Russian retreating columns. To our chagrin we found ourselves prisoners, but we were not alone, for we saw more Russian prisoners than Japanese soldiers during the rest of our stay in Manchuria.

To turn from personal experiences, I make out the history of this night, so fatal to Russian hopes in the Far East, to have been as follows: During the day before, the day of the terrible dust storm, the Russian left was still somewhat disorganized as a result of its retrograde movement, completed only the preceding night. Concealed by the dust, perhaps reconnoitering, possibly lost, a force of several Japanese companies of infantry penetrated to a point some 15 miles northeast of Mukden, far in rear of the fortified line of the Hun. This force was discovered during the evening of March 9, and was reported to General Kuropatkin as the head of a Japanese column approaching his line of communications from the eastward. The order for a general retirement was issued at once, and was for the most part executed during the night of its issue. General Linevitch's left, withdrawing along the road Fushun-Tiehling, seems to have maintained a proper rear guard and to have experienced no great losses. His right and the Russian center seem to have depended more upon speed than other military qualities; they were doubtless hampered by orders to make no stand

in Mukden proper, and their columns passed up to the east of the town, followed, early in the morning, by Kuroki. The Russian right withdrew at first in a comparatively orderly manner, beginning with organizations on the left. But Kuroki had penetrated so far northeast of Mukden that the retreating Russian columns found themselves running the gauntlet between the batteries of Nogi and Kuroki. Trains, infantry, and artillery were in the utmost confusion. It is remarkable that so many escaped. Thus the events of a night converted a by no means helpless situation into something like a rout, and so ended the battle which all observers and participants regarded as, barring Russian naval success, decisive of the war.

Seeing the narrow chances that have determined Russian defeat on more than one occasion, the opinion is forced upon one that modern large-scale battle is necessarily a long drawn out affair, subordinate commanders acting with relatively great independence where the length of the line tends to prevent the spread of local disaster, and the duration of the fight results in the utter exhaustion of the personnel, and sometimes of the ammunition as well. There comes a period when the effective strength of each army is measured not merely by deducting casualties from its original numbers. The remaining vitality of the troops becomes the principal consideration, and at this period it is (to borrow an expression from another game of chance) the general who puts up the biggest "bluff" who wins.

As to Russian losses, I believe a minimum estimate would be 27,000 killed, 80,000 wounded, and 40,000 prisoners, or, deducting 5,000 counted twice (wounded and prisoners), 142,000. The Japanese losses appear to have been about 87,000 killed and wounded out of, say, 400,000 engaged.

About two and one-half times as many men were engaged at Mukden as at Gravelotte, and nearly seven times as many were killed or wounded. As compared with Gettysburg, nearly five times as many were engaged, and there was about the same proportion of casualties.

Indeed, we can not find battles—we must look at entire wars to find losses comparable with those at Mukden. Apparently the Russians killed equaled the total Union

killed in the twelve greatest battles of the civil war put together, among them Gettysburg, the Wilderness, Antietam, Chancellorsville, Chickamauga, and Fredericksburg.

The Russian troops present at the battle of Mukden were as follows:

	Battalions	Guns.
First Siberian Corps, General Stackleberg (Second Army):		
First and Ninth East Siberian Rifle divisions.....	24	64
8 batteries field artillery.....		
Second Siberian Corps, General Zassulitch (First Army):		
Fifth Division East Siberian Rifles, First Division Siberian Infantry.....	28	96
12 batteries field artillery.....		
Third Siberian Corps, General Daniloff (First Army):		
Third and Sixth East Siberian Rifle divisions.....	24	80
8 batteries field artillery, 2 batteries mountain artillery.....		
Fourth Siberian Corps, General Zarubaleff (First Army):		
Second and Third Siberian Infantry divisions.....	32	112
14 batteries field artillery.....		
Fifth Siberian Corps, General Dembovski (Second Army):		
Fifty-fourth and Sixty-first Infantry divisions.....	32	96
12 batteries field artillery.....		
Sixth Siberian Corps, General Saboleff (Third Army):		
Fifty-fifth and Seventy-second Infantry divisions.....	32	96
12 batteries field artillery.....		
Seventh Siberian Corps (Eastern Detachment), General Alexieff, then General Rennenkampf (First Army):		
Seventy-first Infantry division, Provisional Infantry division.....	28	32
4 batteries mountain artillery.....		
First Army Corps, General Meyendorff (Third Army):		
Twenty-second and Thirty-seventh Infantry divisions.....	32	112
14 batteries field artillery.....		
Eighth Army Corps, General Myloff (Second Army):		
Fourteenth and Fifteenth Infantry divisions.....	32	112
14 batteries field artillery.....		
Tenth Army Corps, General Tserpitski (Third Army):		
Ninth and Thirty-first Infantry divisions.....	32	112
14 batteries field artillery.....		
Sixteenth Army Corps, General Rasgonoff (General Reserves):		
Twenty-fifth and Forty-first Infantry divisions.....	32	112
14 batteries field artillery.....		
Seventeenth Army Corps, General Bilderling (Second Army):		
Third and Thirty-fifth Infantry divisions.....	32	112
14 batteries field artillery.....		
Rifle Corps (Second Army):		
First, Second, and Fifth brigades Rifles.....	24	72
9 batteries field artillery.....		
Total.....	384	1,208
6-inch guns.....	50	250
4.2-inch and 4.5-inch guns.....	48	
6-inch howitzers.....	72	
Mountain guns not yet counted.....	32	
Guns of horse batteries.....	48	
Total guns.....		1,458
Infantry, 384 battalions, at \$25.....		316,800
Cavalry, 160 squadrons, at 125.....		20,000
Artillery.....		35,000
Engineers.....		12,000
Total engaged.....		383,800

The whole campaign was a series of tactical defeats for the Russians. Nevertheless it yielded nothing to Japan but a few square miles of a Chinese province. When Mukden fell

and Rozhesvenski's fleet was destroyed, the war was logically ended. The Japanese could not go much farther forward, and the Russians could not hope to retake the Liao Tung Peninsula. Peace became inevitable, but rather because an impasse had been reached than by reason of Japanese successes. Each nation had pressing need to recognize this state of affairs, for Russia must be free to deal with an acute political situation and Japan must avoid bankruptcy.

The circumstances were such that Japan could exact no indemnity. It would be foolish to say that the peace of Portsmouth was a diplomatic victory for Witte.

CHAPTER II.

RUSSIAN ARMY ORGANIZATION, APRIL 1, 1904.

Summary of infantry.

	Number of battalions.	
	Peace.	War.
Guard, grenadier, rifles, and line.....	1,011	1,140
Cossack.....	6	18
Reserve.....	164	463
Fortress.....	59	155
Local.....	^a 149	^b 1
Depot.....		^c 232
Imperial militia.....		658
Total.....	^d 1,240	^b 2,667

^a Detachments.

^b And 148 detachments.

^c In general a depot battalion is formed for each regiment.

^d And 149 detachments.

SYSTEM OF EXPANSION OF INFANTRY.

Sixty-two guard, grenadier and army divisions, in general, each of 4 regiments of 4 battalions of 4 companies; each company about 114 officers and men. In war each company expands to about 250 men.

Twenty-seven guard, Finland, Caucasian, Turkestan, East Siberian, and army rifle brigades; in general, each of 4 regiments of 2 battalions of 4 companies. In war each regiment ordinarily expands to 3 or 4 battalions and each brigade ordinarily becomes a division. Peace and war strength of companies as in infantry. Battalions of 4 companies when not otherwise stated.

Six battalions, Cossack infantry, "Kuban Plastun Brigade." In war expands to division of 18 battalions.

Twelve brigades, Forty-sixth to Fifty-seventh, inclusive, reserve infantry, each of 4 regiments of 2 battalions. In war expand into divisions of 4-battalion regiments.

Seven brigades, Fifty-eighth to Sixty-fourth, inclusive, reserve infantry, each of 4 5-company battalions. In war each brigade expands into 2 infantry divisions.

Two brigades, Sixty-fifth and Sixty-sixth, reserve infantry, each of 4 regiments of 2 battalions. In war each brigade expands into a division of 4-battalion regiments.

Two brigades, First and Second, Turkestan reserve infantry, 4 battalions each. In war each brigade expands into a division of 4 regiments, each regiment with 5 battalions.

Three brigades, First, Second, and Third Siberian reserve infantry, 4 battalions each. In war each brigade expands into a division of 4 regiments, each regiment with 5 battalions, in First and Second divisions, and with 4 battalions in Third Division. In latter part of recent war the Fifth battalion formed a provisional division of the "eastern detachment."

Four additional reserve battalions, each of which, in war expands into a regiment of 3, 4, or 5 battalions.

Eighteen fortress infantry regiments.

Thirteen fortress infantry battalions. Each in war expands into a regiment of 5 battalions.

One hundred and forty-nine detachments of local infantry, which in war expand into 148 detachments and 1 battalion.

Summary of cavalry.

	Peace.		War.	
	Regiments.	Squadrons.	Regiments.	Squadrons.
Regular.....	67	400	68	534
Cossack.....	52	318	153	974
Depot.....	9	65	.....	.....
Imperial militia.....	.....	.....	20	80
Total.....	.....	783	.....	1,588

SYSTEM OF EXPANSION OF CAVALRY.

Each squadron in general has 143 sabers in peace or war; in peace each regiment has 6 squadrons, and in war it has been understood that each depot squadron would expand into 2 squadrons to be added to its regiment, leaving a detachment at depot.

The Cossack cavalry practically trebles itself in war. To each regiment in the active army corresponds two others,

of the second and third category, respectively. In the recent war each regiment had ordinarily 6 squadrons.

Summary of artillery.

	Peace.		War.	
	Batteries or companies.	Guns.	Batteries or companies.	Guns.
Field.....	408	3,264	576	4,608
Mountain.....	10	80	14	112
Regular horse.....	28	168	28	168
Cossack horse.....	20	120	39	234
Horse, mountain.....	3	18	3	18
Howitzer.....	25	200	25	200
Reserve field and mountain.....	43			
Depot.....	15	118	58	462
Imperial militia field.....			80	640
Fortress.....	236	1,888	242	1,936
Siege.....	16	32	64	512
Sortie.....	5	40	16	128
Imperial militia foot.....			40	320

SYSTEM OF EXPANSION OF ARTILLERY.

In general, the personnel of each battery is increased from peace to war footing about as follows:

Field battery from 186 to 246.

Horse battery from 178 to 204.

Horse mountain battery from 203 to 241.

The 43 reserve field and mountain batteries expand into 168 field batteries and 4 mountain batteries.

Summary of engineers.

	Peace.		War.	
	Battalions.	Companies.	Battalions.	Companies.
Sapper battalions.....	30	120	30	120
Independent sapper companies.....		2		2
Ponton battalions.....	8	16	8	16
Reserve sapper battalions.....	2	6	2	12
Depot sapper battalions.....			4	24
Railway battalions.....	12	64	12	60
Reserve railway battalions.....			3	12
Field engineer parks.....	7		7	
Militia sapper companies.....			5	20
Fortress sapper companies.....		12		23
Submarine mining companies.....		15		17
Cadre fortress companies.....		α 4		α 4
Fortress balloon detachments.....		α 7		α 7
Fortress telegraph detachments.....		α 10		α 10
Engineer artificers' detachments.....		α 10		α 10

• Detachments.

Personnel of a sapper company in peace, 137±; in war, 255±; of a telegraph company in peace about 115±; in war,

289±; of a ponton battalion, in peace, 291±; in war, 606±.

At the outbreak of the Japanese war, 25 of the sapper battalions were grouped for training into 6 sapper brigades. Five battalions and 2 independent companies, all in Asia, were unbrigaded. The 30 sapper battalions had 89 sapper companies, 1 ponton company, and 30 telegraph companies. The railway battalions were mostly grouped into railway brigades.

In war, as a general rule, each of the field engineer parks would be mobilized into sections so that every sapper battalion in the field would have a section of field park with it. Two siege parks, each of 4 sections, would also be formed.

SUMMARY OF TRANSPORT AND SUPPLY.

I have only the following to add to the contents of "Handbook of the Military Forces, 1898, Russia," MacBean, which is on file in the Military Information Division.

In addition to the train troops in peace there was a south Ussuri Train Cadre Company, which in war was designed to expand into a battalion of five transport columns. The war strength of this battalion was as follows:

Officers and officials, 28; noncommissioned officers and men, 1,535; horses, 1,990. Other train troops were sent to Manchuria, but I have been unable to get account of them. But the bulk of the transport columns were hired from the Chinese and usually had Chinese drivers. Much of the regimental transport was also Chinese.

SUMMARY OF FIELD AMMUNITION COLUMNS.

There are 70 cadre parks in peace; 52 for the guard, grenadier, and line divisions; 8 for the European and Caucasian rifle brigades; 7 for mortar (howitzer) regiments; 3 for East Siberian organizations. In war these expand into 198 parks, being united into park brigades of from 1 to 4 parks each.

There are 7 reserve parks, which in war expand into 24 park brigades of 1 or 2 parks each for the reserve divisions. There are also 2 cadre mountain artillery parks, which expand into 2 mountain artillery brigades of 2 parks each.

The personnel of each cadre park, about 85, is expanded to about 315 to form the park brigade.

The ammunition parks, also known as flying parks, carry the reserves of ammunition, both infantry and artillery.

The artillery ammunition is carried on wagons similar to the caissons with the batteries. Most of the infantry ammunition is carried on one-horse carts, 6,000 rounds to the cart.

CHAPTER III.

WORK IN RUSSIAN ARMY CORRESPONDING TO THAT DONE IN OUR ARMY BY SIGNAL CORPS.

There is no signal corps in Russia. Its work is done by the engineer department. Officers charged with such work are sapper officers, graduates of the engineer school. A considerable portion, perhaps one-third of those assigned to telegraph companies, are also graduates of the electrical course at the engineer school. There is a course at the same school in military ballooning. A limited number of officers selected from the sappers (including telegraph companies) and (very rarely) from other branches take the three-year course at the engineer academy, becoming engineer officers. Engineer officers do not serve immediately with troops, but are said to constitute a sort of general staff for the technical services.

Before the present war began there were 30 sapper battalions, each composed of 2 to 4 sapper companies and 1 telegraph company. In addition there were to be provided, on mobilization, 8 telegraph detachments for fortress service,

From April, 1904, to March, 1905, the personnel for telegraphy with the Manchurian army increased from 3 companies and 2 fortress detachments to 11 companies, 1 special battalion, and 1 fortress detachment. The work was under General Alexandroff, the chief engineer of the army, and, in each corps, under the chief engineer of that corps, who was ordinarily the colonel commanding the sapper battalion. Ordinarily the telegraph companies were more or less intact, but sometimes the sections were scattered among the divisions or even brigades of a corps. Nearly all the units in the field army were provisional, and the numbers and equipment of units varied considerably.

"Paper" strength of a telegraph company.

	Peace.	War.
Officers	3	7
Noncommissioned officers and men:		
Combatant.....	111	209
Noncombatant.....	1	73
Horses		200±
Carriages		80

The strength of the Port Arthur telegraph detachment was about 100, but before the siege began 70 additional telegraphers from field sapper battalions were thrown in.

The provisional telegraph company at Vladivostok was about 150 strong.

Ordinarily a telegraph company was organized in 3 sections. Two sections have each the material for 16½ miles of air line. One section had material for 23½ miles of cable. An air-line section has 4 Morse apparatus, 12 batteries of 6 cells each, 8 telephones, 2 heliographs, 4 signaling apparatus, 630 poles, 825 insulators, 1,750 feet cable; also 71 light axes, 8 picks, and 1 set each of joiners, smiths' locksmiths' and saddlers' tools. All of above is carried in 28 wagons, of which 4 are station wagons and 4 carry reserve stores. Typical cable section has 24 one-horse carts. But I have seen a telegraph company with only 36 vehicles (mostly four-horse) for technical transport, and 13 for baggage.

These vehicles were drawn by four horses abreast. The load included 3½ miles of wire, in two rolls, and the necessary poles.

The cable was ordinarily carried in two-wheeled carts. Each cart carried two rolls, each roll containing 1½ miles of cable.

While with General Samsonoff, who commanded a division of cavalry, in the mountains, covering an interval of 18 versts (1 verst = two-thirds of a mile) between the left of the main army and the so-called "eastern detachment." I inspected the outfit of a detachment of mounted sappers attached to his command. The pack train of this sapper detachment included two horses carrying each the material for a heliograph station. Each station equipment included an acetylene lamp, on a tripod, for night use. Throughout

the army there was considerable use of the heliograph. I saw both the movable mirror and shutter types in use. There was nothing new or remarkable in the Russian heliograph outfit.

While it is stated above that telegraph companies are equipped with the Morse apparatus, nevertheless during the past winter many sets arrived of a combined telephone and telegraph instrument, probably similar to that devised by our own Signal Corps. I was not allowed to see this instrument.

The service of the telegraph companies was excellently performed. During movements no difficulty was experienced in establishing and maintaining all desired communications. During long periods of rest, as during the winter, an immense number of lines were constructed. Aerial lines to the number of 30 were established between Mukden and various points along the Sha River front. The average length of these lines was about 20 miles. Within each of the corps were an average of 30 miles of aerial wire and cable, and from 20 to 40 stations. Thus the total length of military line while the army was along the Sha River exceeded 1,000 miles, and there were probably 500 stations.

The stations were frequently in station wagons, even where buildings were available. In forts the stations were in secure bombproofs, and there were frequent telephonic connections between the forts and trenches and the positions of the local reserves immediately in rear. Generally, except in the works, the advance stations were on the reverse side of hills, with earth cover. Foreign attachés were not shown the interior of the stations nor the instruments therein.

West of Irkutsk there were 10 galvanized-iron wires, and south of Harbin 5 of the same, connecting the army with Russia. The operation of these wires along the railroad was the work of railway troops. Mukden and Liaoyang are both connected with the Chinese Imperial Telegraph System, via Hsinmintun. During the war the Chinese continued to operate their wires, of course under military censorship.

In addition to the system within a corps, which, when the army was in position, connected each battery commander with division headquarters, a special telephone service was ordinarily established for each battery, to permit of indirect

fire. In the hills the guns were often 800 yards in rear of a crest, and the battery commander, or sometimes another officer as observer, was at some point perhaps three-fourths of a mile distant.

Until after the battle of Sha River the Russian balloon equipment was limited to a fortress outfit, not very mobile, and consequently tied to the railroad. About December 1, 1904, there arrived what was known as a provisional balloon battalion. The zinc for the gas was in wire cages, about 4 by 2 by 2 feet, and a gas plant was established near the railroad at Mukden. This plant was not subject to inspection. I believe it was provided with compressors, but no portion of the balloon train was ever removed so far from the gas plant as to require the use of the metal gas holders. During the battle of Chentanpu a balloon was taken to a point about 15 miles southwest of Mukden, but was not used, as the battle occurred during a thick snowstorm. On this occasion the balloon was inflated at the gas plant, and a reservoir of balloon silk containing about 5,000 cubic feet of gas was to be used to transport reserve gas supplies from the gas plant to the balloon. This same reservoir was used during the battle of Mukden, but the balloon was never more than 5 miles from the gas plant during the latter battle.

It is of interest that General Koludofsky, commanding a battery of about 200 siege guns near the railroad, proposed, during the battle of Chentanpu to direct his fire from the balloon, but the thick weather made this impracticable.

During the battle of Mukden the Russians had one balloon in the air three days, but so far as I could see the Japanese employed no balloon. The Russians always sent up the balloon rather far to the rear, at least $2\frac{1}{2}$ miles in rear of the advanced infantry position. Communication with the balloon was by telephone through a wire in the cable. On the whole, I do not believe that the Russians found the balloon in the field of any great practical value.

At Vladivostok on nearly every clear day an inflated balloon was taken onto a large tug, which was provided with a large square-sail wind screen. The tug then proceeded out of the harbor to the mine field, where two officers ascended to a height of 400 to 800 feet. The tug moved about slowly, and it was said that the submarine mines could be

clearly seen and their positions verified. Hostile mines were sought for. Also, at the greater height mentioned, the horizon was searched for Japanese vessels. Doubtless a balloon ship would be of great value for naval use under many circumstances, to enable observations to be made of the interior of a hostile harbor, with a view to ascertaining the vessels there, and for the purpose of studying the mine field under certain conditions.

The so-called provisional balloon battalion at Mukden was provided with two balloons, spherical, each able to carry up two men, and with two signal balloons of the "dragon" type, which were never used, except for practice. There were two reservoirs of balloon silk. The transportation, as near as I could ascertain, included—

Reel wagons.....	4
Balloon wagons.....	10
Gas wagons.....	14
Carts "stores".....	14
Special wagons for gas plant, etc.....	10
Baggage wagons.....	10

The personnel included about 10 officers and 300 men.

Field glasses were found indispensable, even for private soldiers on outpost duty.

In my opinion most glasses used in the presence of the enemy should be of the highest practicable power. A Roumanian attaché, with the same corps to which I was attached, had a pair, quite large, and extensible in two movements, which magnified eighteen times. His glasses were borrowed time and again by Russian officers of the staff and others, including myself.

To be of much use glasses must be employed from a recumbent position, where they may be steadied, by resting the elbows on the ground or otherwise. Great practice in studying distant ground with efficient glasses will produce remarkable results.

Of course there may be times when five- or eight-power glasses could be used to advantage by mounted men or at dusk.

The question of seeing on modern battlefields is of enormous importance.

The Russians were usually at a considerable disadvantage, because the Japanese were south of them. With the sun at their backs the Japanese could generally see much better than the Russians, who usually had the sun in their eyes.

This question of light is so important that I could conceive it entering into plans of attack, determining, for example, whether an advance upon a certain work, which could be most easily made from east or west, should be made at dawn or dusk.

CHAPTER IV.

ENGINEERS.

A summary of the engineer troops of the Russian army is included in Chapter II, relating to army organization.

In war there is ordinarily assigned to each corps 1 sapper battalion, which usually consists of 3 sapper and 1 telegraph companies. In the corps 1 sapper company is assigned to each of the two divisions of the corps, and the remaining sapper and telegraph companies remain under the orders of the battalion commander at corps headquarters, the battalion commander becoming chief engineer of the corps.

This plan was followed in Manchuria, so far as the exigencies of the service permitted; but several battalions had each an extra company, which was a ponton company, and several others lacked the third sapper company.

Ordinarily the ponton companies of the Russian army are organized into battalions of two companies each. There were two such ponton battalions in Manchuria, and they remained at the disposal of the chief engineer.

Peace and war strength of ponton battalions and sapper companies are usually as follows:

	Peace.		War.	
	Sapper companies.	Ponton battalions.	Sapper companies.	Ponton battalions.
Officers	4	12	4	12
Noncommissioned officers and men	124	277	251	591

In Manchuria the sapper companies were often much larger than as above. The men were for the most part mechanics at the time of beginning their military service.

The transport of a sapper battalion was as follows (as per tables; in practice it was often much less):

	Vehicles.	Horses.	Drivers (noncombatants).
Battalion transport:			
Ammunition carts	8	3	3
Officers' baggage carts.....	2	2	2
Medical stores carts	2	2	2
Ambulance carts	4	4	4
Supply carts	8	8	8
Sapper company transport:			
Intendance, 8 per company	24	24	24
Engineer stores, 8 carts per company	24	24	24
Special wagons, 6 for each two companies, light bridge train	12	36	12
Telegraph company's transport:			
Intendance, carts	30	30	30
Line wagons	28	84	28
Line carts	24	24	24
Total	161	241	161

The transport of a ponton battalion (on paper) was as follows:

Ponton wagons	56
Balk and chess wagons	36
Trestle wagons	3
Boat wagon	1
Tool wagons	4
(each of above for four horses abreast)	
One-horse carts (supplies, ammunition, ambulance, etc.)	30

The equipment of a ponton battalion included 56 ponton sections, 6 trestles, yawl boat (for anchors), balks, chess, 80 pyroxyline cartridges, 200 detonators, 2 telephone outfits, including 7,000 feet of wire, 40 large shovels, 16 heavy and 24 light axes, 8 mattocks, 5 picks, 2 crowbars, etc.

The following tools were carried by the men of each sapper and ponton company: One hundred light shovels, 70 light axes, 10 pickaxes, 20 mattocks, 4 augers, 8 chisels, 4 tracing tapes, 8 crosscut saws.

Each sapper company was provided with its own transport, in which was carried 40 shovels, 40 hatchets and axes, 5 pickaxes, 5 mattocks, 2 crowbars, 2 crosscut saws, 100 sand bags, sets of carpenters', wheelwrights', and blacksmiths' tools, surveying instrument, cordage, nails, 800 detonators, 720 pounds pyroxyline, etc.

Each company of Russian infantry was nominally provided with 80 light Linnemann spades and 20 light axes, and 16 shovels, 8 axes, 3 mattocks, 3 pickaxes, and 1 crowbar were provided for each company in the divisional transport. The mud of Manchuria was too deep and sticky for the Russian foot-soldiers' heavy equipment, and in many cases the men did not carry the full number of small spades and axes.

Supplementary provision of entrenching tools for infantry, and tools and material for the fabrication of obstacles, etc., was made in the section of field engineer park which was attached to each sapper battalion.

The material carried by a section of field engineer park consisted nominally of 1,200 shovels, 220 hatchets and axes, 75 mattocks, 50 pick mattocks, 25 crowbars, 10 saws, 15 fascine chokers, 10 augers, sand bags, surveying instruments, artificers' and blasting tools, cordage, rope, nails, wire, etc., all carried on 10 to 25 wagons or carts. In practice the material carried by the section of engineer field park was usually increased far beyond the quantities above stated.

During the winter of 1904-5 I spent some time with the Cossack division of General Samsonoff, on outpost duty in the mountains, about 50 miles southeast of Mukden. With this command I found 38 mounted pioneers, under command of a sapper lieutenant. Each man carried on his saddle a shovel, a short-handled axe, a coil of light rope, a hammer and nails, a saw or the like. One pack horse carried drills, crowbars, spike pullers, etc.; another pyroxiline; 2 others heliograph outfits and telegraph instruments. There were 4 additional pack horses for food, forage, etc. General Samsonoff said he found these pioneers exceedingly useful.

The Russian ponton is sectional, of steel; there being 12 middle and 44 end sections with each train. The plates are lap rivetted, of a thickness of one-sixteenth of an inch. Each section is strengthened with six transverse angle-iron frames. The end sections are 14 feet 1 inch long, 6 feet $2\frac{3}{4}$ inches wide, and 2 feet $5\frac{1}{2}$ inches deep, outside measurement, and the middle sections are 11 feet $5\frac{1}{2}$ inches by 6 feet $2\frac{3}{4}$ inches by $5\frac{1}{2}$ inches. The gunwales of an end section approach each other, at one end, to within 4 feet; at the same end the bottom curves up gradually to the top of the gunwales. Affixed

to the bottoms of all sections are three wooden longitudinals (about 3 inches by $\frac{3}{4}$ inch), to prevent wear and tear on the steel. Each section weighs about 750 pounds. Bridges are ordinarily constructed with two section boats, but wider bridges are sometimes made with three sections. Sections are hooked together at the top and bolted together at the bottom.

Bridges are ordinarily constructed by successive pontoons. The balks rest on saddle sills, the latter 21 feet between centers, supported on saddle transoms. There are five balks to a bay. The width of a bridge between side rails is about 12 feet.

The ponton sections are carried upon special wagons, to which they are lashed bottom side up.

The Russian trestle is the Birago; very similar to our own.

With the equipage of a ponton battalion, 300 to 315 yards of bridge may be constructed, using five balks to the bay, and the bridge will carry everything but siege artillery. If six balks to the bay be used, 233 to 260 yards of bridge suitable for any traffic may be constructed.

As a ferry, the capacity of a boat constructed of two-end sections is 10,040 pounds when immersed to a depth of 15 inches.

Sectional boats for the light-bridge trains of sapper companies were similar to those described except smaller and lighter. They served for three or four bay bridges, each 60 to 80 feet long.

I understand that practically all European armies are now equipped with pontoons similar to the Russian. Even the French, from whom we adopted our own ponton boat, have, it is understood, recently adopted steel sectional boats.

The lightness of the equipage is much in its favor. I never observed that joints were loosened in transportation or boats punctured on the bottom, and I repeatedly examined boats that had been much used.

In my opinion the time has come to obtain and test a small train embracing sectional steel boats.

The Russians constructed during the war many military bridges other than pontoon.

In a common type of bridge there were employed local

river junks, which are numerous on all the small rivers of China. Mukden and Liaoyang are at the heads of navigation (for such small craft) of the rivers Hun and Taitzu, respectively. These junks are approximately 35 feet long and 9 feet wide, with $2\frac{1}{2}$ feet depth of hold, and are flat bottomed and sharp at one or both ends. The bays were ordinarily 17 feet long, and the width of bridge, between hand rails, 12 feet. The cap, of about 10 inches round stuff, was supported by 3 uprights, resting on sills on the bottom of the boat, each upright being diagonally braced to the boat. The stringers, five in number, were about 9 inches deep by 5 inches wide, rough hewn. Anchor ropes were incased in plank boxes where necessary to protect them from ice. In the bow of each anchor boat was a rough wooden windlass, around the drum of which passed the anchor rope.

The type of bridge most commonly seen was supported on four-legged trestles, which were constructed often without spike and with the simplest of tools—sometimes the ax alone. I believe that this trestle is worthy of adoption in our own service on account of its great simplicity.

The work of the railway battalions was not under the engineer administration, although it had been up to 1903.

There were railway organizations of two separate and distinct characters, one for operation and maintenance of permanent military lines (all broad-gauge lines in Manchuria) and one for the construction and operation of portable military railways. I was never able to obtain details of organization of the portable railway battalion, but I believe there were two in Manchuria.

As to the portable railway, the standard unit was composed of two rails, each 5 feet long, with a 3-foot 6-inch by $2\frac{1}{2}$ -inch by 8-inch pine cross-tie connecting them at one end, and a tie-rod of $\frac{3}{4}$ -inch iron connecting them at the other. The rails were $2\frac{3}{4}$ inches high, of about the same width of base, weighed about 25 pounds to yard, and were similar in section to standard American rails.

There were single unit 90° crossings and single unit curved sections about 5 feet long measured on the inner rail with an extra cross-tie over that shown on the straight section, the inner rail having a radius of curvature of about 35 feet.

In addition, switches, frogs, separate rails in about 15-foot lengths, cross-ties, and spikes were provided in ample quantities. I saw no turntables.

The cars were on bogie trucks and were hauled each by two small horses, hitched one on each side of the car. The horses could readily be faced about when, occupying the same position relative to the car, they could move the same in the opposite direction. There were no locomotives, but there were a variety of cars, including flats, canvas-covered cars for perishable goods and to be used as ambulances, and some rather comfortable ones for passengers.

About 2 miles south of Liaoyang a complete terminal system was constructed by the side of the Manchurian railway, and a line, with branches, swept around from these terminals, between the town and the fortified line, extending about 12 miles to the eastward, in the valley of the Taitzu. The terminal system consisted of seven parallel spurs, at intervals of about 200 feet, the spurs being about 1,000 feet long. Between the spurs the spaces were for storage of provisions, siege materials, ammunition, etc., and a part of it was covered in. This system at Liaoyang was not available during the battle in that vicinity, as its removal began before the battle was well underway.

Again at Mukden, and south thereof, there was a complete organization of transportation facilities, utilizing the broad gauge, to some extent, and including at least 50 miles of portable railway, and I should say 400 cars, mostly flats. But at Mukden the portable railway was only of use during the winter, and the retreat came before the softening of the ground made wagon transportation difficult. For these reasons it must be said that it never rendered any very great service to the Russian army, although it worked well and might have been of the greatest possible use under contingencies that never happened to arrive.

As to roads, there was always the greatest activity in their construction. Parallel to the railroad from Harbin to Mukden an entirely new military road, 30 feet wide, was completed by October, 1904. Branching out, fan-shaped, from Mukden, in connection with the organization for defense of the Sha River position, was developed a vast system of wagon

roads. Parallel to the front and along the lines occupied by the corps headquarters and corps reserves was a road which, near the center of the position, had a width of 80 feet, and between this road and the road proper were narrower roads (about 30 feet wide) approximately every half mile, or radiating toward the front from villages occupied by the corps reserves.

Doubtless these roads were intended only for winter use, as they were not crowned. Ditches were usually placed on both sides, but they were practically useless. Mounds of earth were also placed beside the road on one or both sides to mark its location when covered by snow. The furrows were leveled off; ditches that frequently form boundaries of land ownership in China were filled; ravines and streams were bridged, and plain and frequent signs were placed to guide passing troops.

Of course the principal services of the sappers were in connection with temporary fortifications and intrenchments. It is interesting to note the numerous controversies that arose in the execution of this work between the sappers and the engineers proper. Officers of engineers are graduates of the engineer academy and never serve with troops. Sapper officers are graduates of the engineer school only and the greater number of them never become engineer officers. Both are under the same central administration and in a general way the engineers proper form a sort of general staff for all technical troops.

Now, strangely enough, there appeared to be no well-determined place in a field army for the engineer officers; nevertheless they were sent out in great numbers, some being retained at headquarters and some being assigned to corps. The latter were sometimes made chief engineers of corps. And there was often friction between them and the commanding officer of sapper battalions. General Velitchko was an engineer officer on the staff of Kuropatkin. He designed the defensive works of such positions as Liaoyang and Mukden, but he had few administrative duties.

I have seen thousands of infantrymen and Chinese coolies working on forts and redoubts under engineer officers while a sapper battalion stood idly by, its officers indulging in ad-

verse criticism of the results. Frequently, on the other hand, the sappers were assigned tasks they had entirely insufficient numbers to execute.

It appeared to me that this resulted from the faulty organization and training not only of Russian sappers, but of engineer troops in all armies. The most important work they are called upon to do comes all at once. There has, for example, been an advance or retreat; a new position has been occupied; a vast amount of intrenching is required throughout a long line; and a great many roads must be prepared in rear of the position. A division of 12,000 to 15,000 men may occupy 4 or 5 miles of front. If this portion of the line is to be prepared for a strong defense, perhaps 20,000 cubic yards of earth must be removed in the shortest possible time, and some of this earth must be moved considerable distances and deposited out of sight behind crests or in ravines. If, with this division of troops were one, or even three companies of sappers, they could make no impression on so large a task in the time that would be available, even if all other work were neglected. Obviously, then, the infantry and artillery must execute their own intrenchments, and large detachments of infantry must be detailed for work on the roads and bridges. Indeed, it is not possible to expect that engineer troops will or should be provided in sufficient numbers for more than the following functions:

1. Pontoon work.
2. Sapping and mining, properly so called, in siege or semisiege operations, and a limited amount of pioneer work.
3. A limited amount of the more difficult bridge building.
4. Directing labor of other troops and of civilians in intrenching, construction of obstacles, road and bridge work, railroad repair and operation, and in the very many and great emergencies which are continually arising requiring the work of skilled labor or the intelligent handling of common labor in large quantities.

Now, the Russian sappers were prepared for the three functions first-named above, but their personnel, training, and organization were not of such character as to enable them to serve the army well in the function last mentioned. If a great amount of work was to be done hastily the sappers worked by themselves, while other troops worked else-

where less efficiently than if there had been high-class well-instructed foremen scattered among them. Often the work to be done was so enormously beyond the capacity of the sappers that no attempt was made to use them at all.

That engineer officers generally have come to be dissatisfied with the work of their troops may be gathered from the following quotations from articles published before the late war:

It has been remarked that the engineer arm, not only in the British, but also in continental armies, is apt to isolate itself and act independently, with the result that from want of tactical knowledge their work on the battlefield has sometimes been worthless, if not mischievous.

There is an undoubted truth in this which every engineer would do well to remember, and, as an example, I may quote the battle of Koniggratz, where intrenchments were thrown up by the engineers without reference to the divisional commanders, with the consequence that they were in the wrong place and never occupied, except by the enemy.

Units to work all these have been carefully organized and trained and have taken their well-organized places in peace and war, except that in peace training there appears to be no provision for the right understanding of the field company on the day of battle.

Why should this be? Is it because there is apathy on the subject and that the army at large has never seriously considered the intelligent use of field defenses, or are we of the engineers to blame for never having brought the subject into notice with sufficient persistency? If such be the case we should mend our ways forthwith, and my remarks to you to-day are made with this object in view, and in hope of inducing some of my brother officers, better qualified for the task, to take it up.

You have only to read the reports upon maneuvers in England to become aware of the fact that the practical use of field engineering is neither seriously practiced nor even well understood; not that its practice is so easy when the factor of time is so generally and, perhaps unavoidably, ignored at all peace operations.^a

It is evident, once the difficulty of organizing combined work is recognized, that every opportunity should be given to the two arms (infantry and engineers) to obtain experience at maneuvers and on the flying columns. This is done every year, but somehow or other the sapper work has not been of the use which one must and ought to expect from it.

The complication and often the ill successes of these combined operations at peace maneuvers are due, on one side, to the ignorance of the infantry commanders as regards the duties of engineers and a

^a Colonel Beresford, British R. E.

disinclination to fatigue their men by making them dig; on the other side, to the inability of the commander of the engineer company to orient himself quickly under circumstances of which he has had no previous experience, perhaps to a want of courage on his part in insisting on his rights in the organization of combined work when there is a senior infantry officer present.

Up to the present, however, as far as can be discovered, during the mobile-column season and maneuvers, a false direction has been given to activity of the engineers; either the sapper carried out work which, according to regulations, should have been done by the other arms or they were used as simple infantry companies, or, finally, they were forgotten and the sappers took part in the operations without being of the slightest use to themselves or to the rest of the troops.

As regards the utilization of sappers in combined work with the infantry, especially during the flying-column season (when the bodies employed are less than a division), the state of things has, latterly, got worse and worse. The sappers are either forgotten or employed to take the place in the ranks of battalion of absent infantry companies, or, at the best, when the general wishes to avoid the reproach of not understanding how to make use of engineers, the sappers are employed in digging shelter trenches and gun pits on the selected position, although this is not their business but that of the infantry. The general impression of the engineers gathered from work with the flying columns is that their presence forms a source of unnecessary embarrassment for the general, particularly in the solution of the question what to do with them.^b

In a general way I found sapper officers with the Russian army in a state of dissatisfaction. They felt that they were not doing all they should. Sometimes they were idle when they should have been working, but as often they were overloaded with tasks that other troops should have assisted in. I have thought a great deal on this subject, and it seems to me that the proper solution is a more complete differentiation of functions among engineer organizations and a greater decentralization as well.

At present it is contemplated that the engineer troops with a division of our infantry shall consist of 1 battalion of engineers, 3 pioneer companies, and 1 pontoon company, 19 officers, and 658 enlisted men, under command of a major. Another major will act as engineer officer on the staff of the division. The latter will have "a sufficient force of military assistants, ample funds in his charge, and authority to employ necessary civilian labor and assistance." The staff major

^b Translation from Russian of article "Engineers and their duties."

will exercise general supervision over engineer operations in the division, without exercising direct command of engineer troops, and he will also "make such inspections as may be ordered."

If it be granted, and doubtless it must be, that no greater engineer force than is above outlined can be attached to a division, then what seems to me an indispensable engineer adjunct must be secured at the expense of two of the pioneer companies. Perhaps one pioneer company could be made to suffice for the actual work of driving saps under fire, constructing mines and mine galleries, destroying the principal obstacles preventing an advance against a hostile position, demolitions, and a limited amount of bridge construction when time and opportunity permit. The pontoon company, too, should have its personnel especially trained in all simple kinds of bridge work.

It is proposed that in lieu of the second and third pioneer companies now contemplated for a division there be provided a force of 150 pioneer sergeants recruited from men in civil life who have actually shown ability as foremen of gangs of carpenters, bridge builders, or the like. It is a defect in our military service that insufficient provision is made therein for that class of practical men who, earning from \$75 to \$125 per month, constitute the real backbone of most American enterprises. The secret of the success of most contractors lies in the efficiency of their foremen. The civil engineer who designs a bridge and determines large questions that arise in connection with its construction must be supplemented by handy, hustling, practical foremen who are usually skilled at one or more crafts, but who are for the most part born and not made. We are a practical people because this class is so large among us. The need of these men in the Navy is met by the warrant officers. The signal and artillery corps have demanded them, and their prayers have to a certain extent been answered.

It is respectfully submitted that the engineers can not successfully undertake the direction of most skilled labor at and near the front of an active army without large representation from this class.

It is believed that the money now expended in recruiting, paying, clothing, quartering, and subsisting the 328 enlisted

men of two engineer companies would serve to maintain an organization of 150 mounted pioneer sergeants that would materially increase the efficiency of all the labor in a division. There will always be many skilled laborers in an American army, but there must be men trained to direct this labor in military channels.

I think any officer who has served with our engineer troops as they are now will admit that while we may make good pontoniers or sappers and miners of them a very limited number can be found who are fit to direct the labor of others in any sense whatever. In time of war many high class men of the type desired will enlist, but not in regular engineer organizations. They will be attracted for obvious reasons to volunteer engineer organizations as was the case in the Spanish war. So that in war, with the present system and pay table, we shall witness the very anomalous condition that the regular organizations will contain men of the wrong type, whom for the most part it has been entirely impracticable to train for the duties under present consideration, while the volunteer engineers will be full of good material, accomplished at many trades and at executing and overseeing work, but ignorant of military requirements. We can not even expect to have in our present engineer companies many good workmen at the various mechanical trades. If they know such trades they will not enlist at \$13 per month. If they learn them subsequent to enlistment they soon drop out of the service to better their condition.

In war volunteer engineers will nearly equal regulars in many respects, while excelling them in others, and, on the whole, I am afraid the volunteers will be superior. If one is not mistaken in accepting this as a correct premise, it immediately follows that we should maintain no regular engineer organizations in peace, except for ponton work and for what may be called unskilled labor applied to very technical (military) purposes, or we should change our system and train some selected men already skillful in mechanical trades and as master laborers to apply their knowledge to military requirements.

If we are to retain the present system, it would seem best to supply each division with one regular ponton company.

one regular pioneer company, and two companies of volunteer engineers. But it would seem far better to change the system, as the change would vastly promote efficiency and would cost nothing over the present system. If the change were made we should have, in lieu of our present three battalions of four companies each, three ponton companies, three pioneer companies, and, say, 300 pioneer sergeants. There is no reason for perpetuating the battalion organization either in war or peace. Each ponton company should be partially equipped at all times, the balance of the ponton equipment for the three trains being kept in condition at a central depot. Ponton and pioneer companies should form part of the garrisons of ordinary large posts, one company at each.

The pioneer sergeants might be organized in provisional companies, but in use they would be scattered through a division in very small detachments. They should be enlisted, say, for ten years, three with the colors and seven with the reserves, which it is hoped will be soon established.

For the first year they should be at school; for the next two at large posts. They should be mounted at the school and in war, and when desirable at other times, and each one should be armed with a revolver and carry one or more tools on his saddle.

A number, after finishing the course at the school, could be employed as foremen on engineer work, especially upon fortifications.

The Russian and Japanese armies confronted each other for five months along the Sha River. Each was quick to detect a local weakness in the other's front and take advantage of it. There was a continuous, but, of course, desultory bombardment all along the line. Heavy artillery was employed, up to 11-inch howitzers. Attacks by infantry both day and night were always to be apprehended. In many places the methods of siege were applied, and there was mining and countermining. Under such circumstances it is believed that the fittest types of fortifications survived, and that the true principles of fortification, under existing conditions, asserted themselves. Furthermore, it is believed that the principles are the same and the types not far different, whether the fortifications are temporary or permanent.

DISPERSAL.

The old idea of the line of detached forts needs modification. Until very recently this was the accepted theory of the proper distribution of defensive strength. Some, mainly followers of Brialmont, believed that the detached forts should be of massive construction, able to shield artillery from any amount of hostile fire. Others, constituting the school of "near and distant" defense, held that the detached forts should be simply infantry redoubts, with concealed artillery positions in the intervals. In 1902 Capt. H. F. Thuillier, of the British Royal Engineers, in a book entitled "The Principles of Land Defence," elaborated a scheme of fortification in which the infantry redoubts were to be replaced by fortified pivots. Each of these fortified pivots could be briefly described as a group of detached trenches and gun pits, adapted to the site, strongly defending an area considerably greater than the old redoubt and sweeping the intervals upon its flanks. The system evolved by the Russo-Japanese war is but a further evolution from the system of "near and distant defense."

Strategy generally determines what positions shall be fortified. The character of the works is determined by tactical considerations. There are interesting parallels to be traced between the tactical handling of troops and the tactical distribution of the units of fortification. A discussion of this nature would be out of place in this report; but it is timely to invite attention to the fact that precisely the same tactical considerations that have developed the approved method of attack by successive skirmish lines have established the principle of dispersal in fortification.

A fortified line, whether its plan be a closed figure embracing a city or a straight or broken line marking the front of an army, should be marked by the absence of localized and congested defensive units, which would simply form satisfactory targets for the enemy's artillery.

Troops will and should be trained with great care in night marching and night attack. The difficulties formerly dwelt upon in connection with night attacks may be largely overcome by careful practice. Drill regulations should treat

especially of methods and formations for conducting such operations.

Now, the effect of this certainty of night attack is to render insecure the defense of intervals between works or between fortified pivots. The properly fortified line then becomes practically continuous. Individual works are ordinarily but short trenches conforming to the ground. These short trenches are not in a continuous line parallel to the front, but occupy what may be called a defensive belt, of a width varying between 200 or 300 yards and half a mile, depending upon the ground and the importance of the sector. Each of the small units is of the least possible depth (extension in the line of hostile fire). Many should be provided with bombproofs. Some should be designed for fire either to front or rear. Trenches subject to enfilading fire should be of short length or broken and well traversed. Deep covered communications, either zigzagged or traversed, should be multiplied within the belt, and connect the works with the naturally or artificially protected places for the supports. Two to 4 miles inside the belt, approximately parallel thereto, but concealed wherever possible by the folds of the ground or by vegetation, should be a road, as well built as possible, of a width up to 60 or 80 feet for grand positions. Along this road are situated the headquarters of larger units, most of the reserves and depots of ammunition, food supply, etc. From this great road, which would often be paralleled by rails, should branch out, fan shaped, a system of narrower roads connecting it with the supports behind the belt. These roads, especially toward the front, should be located with the greatest care to secure concealment, and, in places, might have to be sunken or traversed.

When there is time, all intersections of roads should be provided with signboards indicating the direction and distance to important points. Similar signboards should be placed in the covered communications at the front. In addition to these signboards, maps showing the roads, covered communications, and defenses should be posted in all convenient places. This practice would increase the chance of affording information to the enemy, but the resulting benefits would outweigh this risk.

military map making. In the first place, considering the size of the map, it should fold conveniently and fit into a waterproof case that will in turn fit the upper left-hand pocket of the field-service blouse. Assuming that the pocket were large enough (and it should be so made) to hold a case 5 inches wide by $6\frac{1}{2}$ inches deep, it appears that maps might be conveniently made 18 inches square on the border.

General maps covering the theater of war, showing the important towns, roads, railroads, rivers, and mountains (the latter by hachures), should be on the scale of 1 inch=10 miles.

In addition to these general maps, if carefully prepared, the only maps that would be required, except for very special purposes, would be on a scale of 1 inch=1 mile. On these large-scale maps elevations should be shown by contours, the interval depending upon the relief of the country. Probably 20-foot or 100-foot intervals would serve in almost any case. Upon these large-scale maps the tactical value of the ground could be sufficiently studied and the position of works indicated.

CHAPTER V.

LESSONS AND OBSERVATIONS.

Let us now turn to some of the lessons, both large and small, that may be deduced from the war.

Perhaps the fact most obviously shown is that expansion of territory or of influence far from the seat of a nation's military strength is a very dangerous proceeding unless long-distance transportation facilities be plentifully developed and the line of communications be perfectly protected. Applied to our own case in the Philippines, on the Isthmus of Panama, in China, and in South America, this means a large navy, and transportation facilities far in advance of those that could be furnished by our mercantile marine. The navy, with perhaps too halting steps, we are now building. It appears that ocean transport adequate in time of need can only be secured by permitting American registration of foreign-built ships, or providing some form of subsidy to shipping, conditional upon the construction and use of vessels subject to the call of the Government and perfectly adapted to war functions.

Another lesson concerns the reserves of trained men that must be poured into organizations at the front if in war early disasters are to be repaired or initial successes followed up. Alone of the greater nations, if recent reports from China be correct, the United States possesses no reserves of this character, although many minor nations have provided for them.

If we should ever have to land troops in Argentina or Chile we should, I doubt not, be very much surprised and chagrined to witness the advantages secured by those little nations through their adopted systems of military training. Of course the reserves are secured ordinarily by means of conscriptional laws, and if Great Britain resorts to some form of conscription, we shall be almost alone in the lack of it. Now, one would be foolish to advocate conscription in the

United States during peace, although both North and South resorted to it during the civil war. But when we see every army in the world that is worth the name existing not merely to perform the semipolice duties of peace, to be filled up in war with untrained volunteers and bounty men, but, as its principal function, training great numbers of reservists for which in war it will merely form the nucleus, it seems worth while to consider whether, without conscription, and by methods which must be popular with the people, we can not accomplish the same result. To suggest a plan, a certain proportion, say 30,000, of our Regular Army might be enlisted, each man for a period of, say, 15 years, the first three years to be served with the colors, as now, and the last twelve years on the reserve list, where he would receive a certain sum, say \$40 per year, so long as periodical medical examinations should show his continued fitness and in return for a continuous readiness to return to the colors in time of war. Thus more than 100,000 reservists might be developed and maintained for an annual expenditure that, as a maximum, fifteen years hence would not materially exceed \$5,000,000.

As to the chance of war which would threaten us with invasion and disaster, it is only necessary to reflect upon the speed with which nations now align themselves in groups bound together by communities of interest. It is not only easy to conceive that in the near future there may be formed such groups hostile to us, but contemplation of our increasingly successful invasion of foreign markets with manufactured goods; of our strategic weakness resulting from the ownership of islands beyond the sea; of the tempting bait that will be afforded by a nearly completed isthmian canal not yet able to add to our strength by giving passage to our naval vessels; of the Monroe doctrine, with its attendant dangers, and of the fatuous optimism so widespread now among our people, which is not unlikely in the future to compel the Government to assume an indefensible position; contemplation of all these circumstances must lead to the conviction that such hostile groups are almost certain to form. If some such group does not involve us in war, a war that will be shameful and disastrous to us, it will only be because we have made the necessary preparations to defend ourselves.

Against such a hostile group command of the sea probably could not be maintained. Despite the great importance we justly attribute to the Navy, in the end it must be admitted that its principal functions are but to defend or attack the lines of communications of armies where the same lead across the seas. If the Navy can not prevent invasion, it may well be worse than useless, as was the Russian navy in the Far East during the recent war. In the last resort, to prevent the final catastrophe of war, it is after all the Army that is required.

In the late war there has been but small demand upon Russian strategy. In the early days, before the converging movements of Japanese had brought them before Liao-yang, each of the two Russian wings, one on the railroad and one in the mountains, was sufficiently pressed by superior numbers to prevent the detachment of considerable forces for the reenforcement of the other wing. There seems no opportunity to crush the Japanese flanks in detail. After that the Russians simply sat upon their railroad. In this connection attention is invited to certain advantages possessed by the Japanese that facilitated their great turning movements. Whereas the Russians have been tied to a single line and could only experience irretrievable disaster if thrown from it, the Japanese possessed and used two lines of supply, from independent bases, to wit, the railroad at Dalny, and the rail and wagon route from the Yalu via Fenghuanchen. In case of defeat, the Japanese could have retreated by either route if cut off from the other; and besides the line mentioned there was available as well the potential route from Newchwang to Hsinmintun. It is not to be doubted that the Japanese would have used this line in case of necessity, as they seized its northern terminus at the beginning of the battle of Mukden. Indeed, the whole coast line, wherever there was a port for transports, was a potential Japanese base and, due to the Japanese navy, an impregnable base. In effect it was as though the Russian army were based upon a long and weak line perpendicular to its front, while the Japanese army was based upon a line parallel to its front, near the theater of operations, of great length, and unassailable. The great advantages accruing to the Japanese are obvious.

A criticism of Japanese strategy frequently encountered in Manchuria was based upon the opinion that the Japanese should not have invested Port Arthur during the early days of the war, but having blockaded it by sea, should have interposed between it and General Kuropatkin, advancing quickly against the latter and overwhelming him before his army could be brought up to respectable dimensions. It is apparent now that this plan would have invited disaster. Kuropatkin would doubtless have retreated, in accordance with his original plans, even as far as Harbin. The investment of Port Arthur would have been so long delayed that it would probably have harbored for many months longer than it did a large portion of the fleet originally there. Under such circumstances the coming of Rozhenski would more seriously have threatened to deprive Japan of the command of the sea.

It is interesting also to reflect upon what would have occurred if at the outbreak of war the Russian fleet in the Far East had been limited to a few protected cruisers, all battle ships being retained in home waters. It is quite evident that in such case by the summer of 1905 a fleet might have been dispatched to the theater of operations with sufficient strength to crush the Japanese beyond the question of a doubt. Indeed it can not be believed that the Japanese would have precipitated a war if the Russian navy had not been scattered to their liking. This is, to be sure, a naval question, but strategy is much the same on the land and on the sea, and one is forced to wonder why we maintain several battle ships on the Asiatic station, subject to destruction in case of sudden war.

More immediately in the line of our business are questions relating to distant naval stations, which must be defended largely by the army, though existing for the convenience of the navy. The experience of the Russians with Port Arthur and Dalny suggests the advisability of confining our plants to be developed across the sea for commercial and naval purposes to the same harbors. Of course it is possible to fortify any number of harbors, but such a course is not economical of expenditures in time of peace, nor of men in time of war.

With regard to cavalry, its use in the present war, except

for scouting, has been most disappointing, although the Russian cavalry has been taught to fight on foot and carries a good rifle. Some of the Cossacks were undoubtedly inferior troops, many of the men in some organizations being taken from the Buriat and other Mongol tribes of Siberia, but more than half the cavalry was made up of such good troops as the Siberian and Don Cossacks, and there were a number of excellent dragoon regiments. While with the Cossack division of General Samsonoff during the winter of 1904-5 I had opportunity to study the character of the men and officers and the methods pursued in scouting, outpost duty, etc. General Samsonoff was one of the best cavalry leaders in the army. He knew the Russian cavalry was not accomplishing what was expected of it, and naively reasoned that the lack of Japanese cavalry afforded a sufficient explanation.

General Kuropatkin, I have heard, came to regret that he had brought out so much cavalry, burdening the railroad with its transportation and adding to the difficulties of supply. If, for example, he had been content with half as much cavalry, say 12,000, he might have had 30,000 or 40,000 more infantry.

The Russian infantry is composed of as obstinate troops as there are in the world. It is hard to drive them back if they are ordered to stay. Now, the cavalry were of the same race for the most part, but when fighting on foot they showed no great obstinacy, either in attack or defense.

General Rennenkampf, from whom great things were expected as a cavalry leader, remarked on his arrival in Manchuria that he had given great study to the celebrated cavalry raids of the American civil war, and it is of interest at this time to make some comparisons.

In the first place, the tables of losses in the civil war do not show that our cavalry, any more than the Russian, ordinarily fought when dismounted with the stubbornness of infantry; secondly, it appears that in our war the cavalry was armed with a rifle far superior to that of the enemy's infantry, and thirdly, the Russians were operating against an enemy numerically superior, who could spare sufficient infantry with machine guns to guard important points on the line of communications. Moreover, Japanese cavalry was always

accompanied by considerable bodies of mobile infantry. There is no reason to believe that under similar circumstances cavalry of the character and quality of our own could do much better, although doubtless it is better officered.

It seems doubtful whether men whose most important functions are other than infantry functions, and who fight with the means of retreat close behind them, can ever be expected to fight as will first-class foot soldiers.

During the latter months of the existing war there was not much opportunity for cavalry screen work. Indeed, the Russian infantry maintained such close touch with the advancing Japanese from the very start that there was no chance whatever for such important cavalry operations as characterized the earlier days of the Franco-German war.

Our own cavalry, if brought up to its full legal strength, would be about two-thirds as numerous as the cavalry force that General Kuropatkin considered unnecessarily large for an army of nearly 400,000.

Of course, when belligerent nations possess a common land frontier, it is most important for either to have a preponderance of cavalry, to cover the mobilization of its armies. In the case of our own country, such importance would attach to cavalry in wars with Mexico or Great Britain, but in the more probable case of war with some continental European power, or with a South American or Asiatic country, whether the war were waged at home or abroad, we either should not need all our cavalry, or would find ourselves unable to transport it to the seat of war, as was the case at Santiago, where most of the cavalry served dismounted. In the improbable event of an invasion of the United States, the difficulties of transport would prevent any enemy, except England or Mexico, from employing such cavalry.

Fitting the lessons of the present war to our own needs, it seems worthy of inquiry whether, assuming that our total expenditures for military purposes must remain constant, money could not be saved on our cavalry to increase the strength of our field artillery and the mobility of at least a portion of our infantry.

With regard to artillery, the present war taught many lessons. Gun for gun, the Russian, although not a perfect

rapid-fire, was far superior to the Japanese. The recoil of the Russian gun was taken up by means of a hydraulic cylinder, assisted by rubber rings on a long spindle between the cheeks of the trail, and the trail was provided with a spade. But the recoil was taken up too quickly and there was a slight jump that deranged the aim progressively with each shot, necessitating a new pointing after three or four shots had been fired. The Japanese carriage was provided with breaks and recoiled with the gun. It might be considered of an obsolete type. The Russian projectiles ranged farther and were heavier than the Japanese, and the Russians, after Liaoyang, had a greater number of guns. Russian battery officers were well instructed, many being graduates of the three-year course at the artillery academy, and all of the three-year course at the artillery school. Nevertheless the Japanese artillery seemed the more efficient on almost every occasion. In the earlier days of the war the Japanese superiority was attributed to their employment of indirect fire, and later, carelessly, to their better gunnery. But the Russians soon learned to conceal their guns most effectively, either behind rises of ground or otherwise, and there is no reason to believe that their marksmanship was inferior. One is thus forced to the conclusion that the tactical employment of the artillery arm by the Russians was bad. As has been remarked heretofore they had excessive artillery reserves, and they scattered the fire of the batteries. In this connection, however, it is well to remember that the Russians were generally on the defensive, and that under modern conditions concentration of artillery fire is naturally much easier for the other side, which can select its own points of attack.

So far as could be seen the big guns on neither side produced any marked effect. At the beginning of the battle of Mukden the Japanese were throwing 11-inch shells into the works occupied by the Fourth Corps, to which I was attached. But there were no strongly centralized points of resistance, like the permanent forts of Port Arthur, and the big shells, falling among the scattered fieldworks, produced no damage worthy of the name. The men actually laughed at them. Moreover, the 11-inch howitzers could not be

moved forward in case of an advance nor saved in case of defeat. The great Russian siege battery of 200 guns, near the railroad south of Mukden, also seemed to produce little effect against the Japanese works.

It seems fair to say that the value of heavy guns is relatively great only against troops or material crowded into restricted areas; against strongly localized defenses, such as permanent forts; or where unusual conditions of terrain and atmosphere permit fire against ordinary battlefield targets at very long ranges.

Referring to field warfare (as distinct from the siege of Port Arthur), even where field fortifications are extensively used, it is not possible to deduce from the events of the Russo-Japanese war, that the number of guns should be increased beyond 4 to the 1,000 infantrymen, or that a great number of heavy guns are of any marked advantage. The Japanese won at Mukden with, to the best of my information, about 3 guns to 1,000, as against the Russian proportion of nearly 5 to 1,000. The 270 \pm heavy guns and howitzers of the Russians were never much more than an embarrassment.

The Russian field guns fired shrapnel almost exclusively. A few field pieces of obsolete type were brought out however with a special view, I was told, to the use of the high explosive shell. This would seem to indicate that the Russians were afraid to use the latter in their latest guns, but I could never find out whether this was really the case. The larger Russian guns (4.5-inch and 6-inch siege) fired common black powder shells almost exclusively. The Russian high explosive shells, of which very few were used, were loaded with a substance practically identical with Melinite or Shimose. The latter, however, appears to be rammed into the shell in the form of powder, while the Russian explosive is run or molded in. I was told by field artillery officers that they needed a proper high explosive shell badly, and that "in a few months" (from March, 1905) they would be available for their new types of field guns. I was informed that the reason more high explosive shells were not brought out for the heavy guns was because of the danger incident to so long a rail haul. I judge the eccentric behavior of their high explosive had not been entirely eliminated at the time the war began.

From what I saw of the Japanese projectiles I am of opinion that field batteries should certainly be provided with a high explosive shell for use against buildings, organized centers of defense, hostile batteries in entrenched positions, etc. I can also vouch for the great moral effect of the same.

The circumstances that the Russians, facing south, were generally pointing their guns with the light in their eyes all through the campaign placed them at a distinct disadvantage. It is of the utmost importance that, in massing guns in battle, consideration should be given to this subject of light. If the attack is to be in the afternoon, other things being equal, the guns should be to the west of their target. A careful regard of light conditions will vastly increase the accuracy of fire.

In a flat country battery commanders will find it necessary to use observation stations of a considerable elevation. The Russian so utilized high trees, the tops of houses, towers built of bamboo and cordage, and late in the war they brought out from Russia special wagons, each containing three sections of a steel frame tower that could be quickly erected to a height of 39 feet.

Nothing in the Russo-Japanese war demonstrated that, in field battles, the infantry has lost its supreme importance. The increasing frequency of the night attack, as the war wore on, robbed the artillery of a portion of the glory that it received in the earlier period of the struggle. I think also that it is only fair to invite attention to the fact that correspondents and attachés, being for the most part in rear of the infantry firing line, behold the effects of artillery fire often, but of infantry fire rarely. For this reason less is written of the latter than of the former. Moreover, as the Russian army was for the most part being forced back, men wounded by artillery fire were more apt to reach the surgeons than were those falling in the infantry firing line. This was one reason that Russian statistics showed so large a proportion of wounds to be due to artillery fire. As might have been expected the Japanese statistics gave no such indications.

If artillery is still to be regarded as an auxiliary arm, nevertheless, it appears that it is a much more serious matter to have erroneous theories regarding artillery than regarding infantry tactics. A few fights appear to hammer the tactics of disciplined infantry into the proper and only

reasonable shape. But the work of the artillery is less direct and its tactics do not speedily improve with experience, almost automatically, as do the tactics of infantry. It is often necessary to form conclusions deductively and draw upon the science and instinct of the officer as developed by his education and training.

The field artillery seems to-day to require the services of officers of the highest training. Its guns must be aimed by methods analogous to those employed by the Coast Artillery. It has no electric light plants to operate, but, on the other hand, it will often have to work in darkness. It will have to locate its guns perhaps many times in a single battle, and it will have its horses to care for. It is beyond nearly all others a special service, which can not be improvised in time of war. It would appear that in peace we should have a very large proportion of the field artillery we shall need in war.

With regard to infantry the lesson, as I see it, is, beyond all other things, to make it more mobile. Mobility was always important in strategic marches, but to-day, with immense battle fronts, it is often several days march from one flank of an army to the other. A simple tactical movement may require, as with Nogi, a march of 60 miles. The troops who can move most quickly, with the least loss of vitality, will be able to win with considerable odds against them. With regard to the clothing of the troops, especially in winter, to promote mobility, we can learn nothing from the Russians, but much from the Japanese. The outer Japanese coat was very light in weight, but from a loose woven material, not very durable perhaps, but remarkably warm, and the coat was fashioned with a most exaggerated looseness. The sleeves were of at least twice the circumference of our overcoat sleeves, and were so long that they were ordinarily turned back 6 or 8 inches at the wrist. One side of the front lapped over the other side by about 18 inches, and a cord fastened to the overlapping side was tied round the waist to hold the coat together in front. The collar was lined with fur, which could be turned up around the ears. Under the coat was worn a sleeveless sheepskin jacket, also lapping over in front. Each man had one suit of very heavy knit

woolen underwear and a close-fitting knit head-and-neck cover of the "Balaclava" type. The Japanese shoes were excellent for marching, but only fairly suited for winter use, warmth being secured by the use of additional woolen socks.

The Russian overcoat was very heavy, and while looser than ours was entirely too tight when worn over furs. The inner sheepskin coat had skirts of some length and sleeves as well. Thus the soldier was incommoded by his skirts while marching and could scarcely bring his rifle to his shoulder on account of the tightness of his sleeves and arm-holes. The Russian boot is the best boot in the world, but those issued to the infantry soldier were comparatively stiff and heavy, and there were many sore feet. The best foot gear I have ever seen for use of infantry in winter was worn in Manchuria by the Swedish military attaché, who stated that it was in general use in Sweden. It was of the moccasin type, of a heavy flexible leather, the feet lined with fur or felt, and the tops laced about the ankles. I have seen similar shoes in the logging camps of Wisconsin and Minnesota.

To promote the mobility of our infantry and to equip it for campaigning in winter, when it is most difficult to preserve mobility, it is believed that we could with great profit adopt clothing of the type used by the Japanese. Foot gear of the Swedish type should be tested. The canteen should be of aluminum and smaller than that now carried. We should adopt the Russian soup kitchen, and then we could substitute a small, light, aluminum pail for our meat can and tin cup. But most important of all, it is thought we should provide a certain number of pack horses to accompany each company of infantry, carrying much of its ammunition, intrenching tools, and rations, and perhaps the shelter tents and blankets. If an infantryman could be relieved of 30 pounds of the weight he now carries, he should be able to march 30 per cent farther in a day than he can now and with no greater loss of vitality. If the Boer war and our Indian campaigns have taught the value of mounted infantry against a mobile and scattered enemy waging war of the guerrilla type over a great area of sparsely settled country, the present war in the Far East between great armies of

highly organized military powers has taught the supreme need in really great wars of what may be called foot cavalry.

An interesting and effective plan adopted by the Russians to secure concert of action between units is worthy of our attention.

With corps headquarters was an officer from each adjoining corps, and from each division of the corps itself. These were known as officers of the *Svias* (bond), and it was their duty to keep the units from which they came thoroughly posted upon the plans of the corps commanders and upon the military situation in so far as these units were affected. A very desirable mutual understanding was thus secured, and the results seemed amply to justify the detail of so many officers upon this duty.

The searchlight was very little used by either field army, although the Russians had a number of movable plants about Mukden. On one occasion, I saw a Japanese searchlight located near Shaho station, on the railroad, with its beam directed up the track, and apparently fixed. Immediately opposite this searchlight the Russian artillery was particularly plentiful, and several hundred guns had it within range. A great number of projectiles were fired at it, and the Russians claimed to have put it out of commission. It certainly stood its ground for several hours, and there is no evidence that it was destroyed.

Often it occurred to me that the proper tactical use of the searchlight, when developed, would greatly facilitate night attacks. For example, if several searchlights were directed upon a selected point of attack, troops marching forward in the dark intervals would be guided by the same beams that would blind the enemy.

It would be worth while experimenting on these lines at peace maneuvers, if the proper plants were ever available.

On the whole, there was little development of novelties in the recent war. Indeed, we must resurrect the distant past for examples of some of the implements and methods used. The bayonet is not obsolete, nor is the officer's sword a mere badge of authority. In the close fighting many men are wounded by brickbats; and hand grenades are most useful weapons. The methods of siege laid down in the books are

now known to be not much altered. What counted most were not new-fangled devices and surprising methods, but the preliminary training of the troops, the right tactical use of all arms, and the proper administration of the great military business of supply and transportation.

Finally, it may be said that when, under present conditions, two countries reasonably well prepared make war; the result is apt to be so near a draw that even victory is extremely unprofitable. This is a splendid fact, as it makes for peace, and may eventually lead to partial disarmament by international convention. But countries which will not prepare for war, while others insist on preparation, are the countries who are so acting as to retain war in the scheme of civilization.



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